AMERICAN GAS ASSOCIATION MONTHLY

Vol. I No. 2

February 1919

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AMERICAN GAS ASSOCIATION
MONTHLY

ADDRESS ALL COMMUNICATIONS TO THE AMERICAN GAS ASSOCIATION, 130 E. 15th ST., NEW YORK, N. Y.

Editor, ... Louis Stotz
Associate Editor, . T. M. Will

Vol. I FEBRUARY, 1919 No. 2

WITH THE EDITOR.

Looking Forward

Sometimes it makes little difference in the things we ultimately accept, whether we foresee their usefulness and grasp them at once, or fight against their adoption. There are some events and conditions that come upon us inevitably—whether we like them or not. The main difference produced by our attitude is in the advancement or postponement of the benefits resulting from the change.

The war has made one thing clear to the gas industry no less than to practically every other industry in the country—many of the old pre-war methods and conditions under which we managed to do business are gone forever. We have no choice but to accept the future. There's no other way out.

The question then arises: Shall we have greater prosperity if we embrace new conditions at once, and willingly and aggressively get in touch with things that are coming; or is it our wisest plan to fight the new trend at every step—to forget that to-morrow is bringing a new set of problems, while we try to live in and according to the past?

The answer is so obvious it hardly needs statement. Already leaders in the gas industry have made public utterances concerning our present and future outlook, while leaders in other fields have spoken words that apply equally to us. The burden of the whole opinion is—"We face a new era."

The materials we must use, the methods by which we must use them, the standards which we must maintain in our industry have all changed more or less, as has the direction of development for the utilization of gas. If we insist upon remembering only the records left by gas men of manufacturing and commercial departments of a decade or two ago, we are lost, so far as a solid prosperity built upon adequate returns on real service and public goodwill is concerned.

The adaptation and application of the most progressive business ideas will mean success for us provided we give ourselves whole-heartedly to the task, not expecting the future to take care of itself.

There is just an inclination on the part of the gas man to draw back a little. He reads in each day's paper of socialistic and other destructive activities. The opportunities of the days ahead of us are without parallel, he is convinced, provided only this lawlessness under the guise of law does not entirely annihilate the business system under which our industry has always lived. "Guess I'll wait and see."

But the worst of all mistakes lies just there. Every business man thus waiting turns loose another band of labor with both time and perhaps a bit of a tendency to express ruffled feelings in a radical form. That same policy leaves an amount of capital with one less chance for solid investment and one more invitation to promote those activities which tend to increase unsettled conditions.

Push legitimate business now; spread, not only by talk but by your activities, a confidence in our commercial stability. Good service, and prosperity for both employees and employers are the gas companies' future, provided that future is seized now and cultivated with determination and progressive business sense.

AMERICAN GAS ASSOCIATION MONTHLY

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Big Attendance at the March Conference

HOTEL ASTOR, NEW YORK, N. Y., March 13-14, 1919

East Ball Room—Eighth Floor

THE special Conference of the American Gas Association, which has been called for March 13-14, at the Hotel Astor in New York, has the distinction of being the first general gathering of the American Gas Association since its formation in June.

Special invitations have been issued to delegates of company members and to all committees, a combined list of some five or six hundred Association members. The Officers and Executive Board will also be in attendance.

The possibility and advisability of creating an Advertising Section of the American Gas Association has been suggested and this matter will come up at the Conference for a thorough discussion. Such a Section would include in its membership the "publicity," "advertising," and "display" men of gas and manufacturer companies.

The Executive Board has ruled that an Advertising Section will be formed provided at least fifty members make written application for the creation of such a section and such action is approved by a majority vote of the active members at the March General Session.

That the March Conference will be well attended by representative men in the industry is clearly indicated in the number of acceptances already received at the Association Headquarters, to the invitation extended by the Executive Board to Company Members and Committees.

PROGRAM AND ORDER OF BUSINESS

HOTEL ASTOR, EAST BALL ROOM, 8TH FLOOR, NEW YORK, N. Y.

MARCH 13-14, 1919

MARCH 13, THURSDAY MORNING, TEN O'CLOCK

Special Executive Session

Meeting called to order by the President

Election of Nominating Committee

Special General Session

Incorporation of the Association—resolution, discussion and vote

Address by the President

Paper—The Future Sales Policies of the Gas Industry and Their Justification
James P. Hanlan, Public Service Gas Co., Newark, N. J.

Discussion

MARCH 13, THURSDAY AFTERNOON, TWO O'CLOCK

Papers—Technical Section

Obtaining the Best Possible Operating Results with the Inferior Quality of Raw Materials at Present Being Received
Use of Electricity in Dehydrating Tar
Wet Purification of Gas
Disposal of Waste from Gas Plants
What Shall We Do with Our Light Oil Plants?
Heat Economies of By-product Coke Oven Plants
Heat Economies of Coal Gas Plant at Rochester, N. Y.
Value of the Chemist to the Gas Industry

Paper—An Analysis of Present Market Conditions
Edmund S. Dickey, Maryland Meter Works, Baltimore, Md.

Discussion

MARCH 14, FRIDAY MORNING, TEN O'CLOCK

Shall an Advertising Section of the Association be formed?
After discussion of this subject, a vote of members will be taken as to whether such a section shall be organized.

Paper—The Development of Industrial Fuel Business
Wm. A. Ehlers, Industrial Fuel Engineer
American Gas Association Staff

Discussion

Open discussion on topics of general interest to the industry

National Committee on Gas and Electric Service Closes Washington Office

The following letter, which was sent to various governmental departments in Washington, D. C., will be of interest to all gas men. A history of the National Committee on Gas and Electric Service as its activities pertained to the gas industry was published on page 20 of the A. G. A. Monthly, January, 1919. It will also be noted that the Committee itself is not being dissolved; the announcement covers merely the closing of its offices in Washington.

January 27, 1919.

To Government Departments,
Washington, D. C.

The curtailment of all war activities as a result of the signing of the Armistice and the gradual relinquishment of direct and indirect supervision by the Government of industrial activities incident thereto, practically eliminates the necessity of the co-operation which the National Committee on Gas and Electric Service has been rendering to its various departments. The maintenance of the Washington office of this Committee is, therefore, no longer necessary and it has been decided to close the office in the Munsey Building, Washington, D. C., on February 1, 1919.

Should there be any service which the Committee may be able to render, or information which it may be able to furnish to Government departments, requests for such information should be directed to the Committee's New York Headquarters, 15th St. and Irving Place.

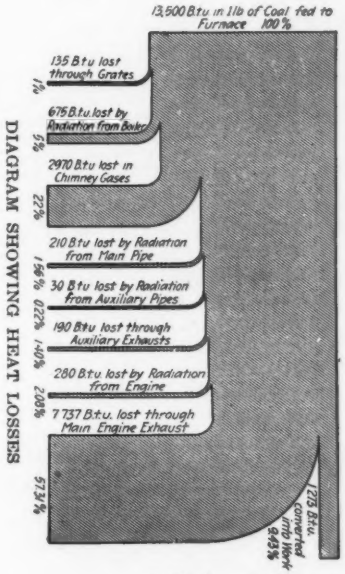
We beg to assure you of the Committee's hearty appreciation of the opportunity which you have afforded to the gas and electric light and power companies of the country to render service to the Government and of its readiness to render any further service that may be desired.

Very respectfully,
National Committee on Gas & Electric Service,
JOHN W. LIEB,
Chairman.

GEORGE W. ELLIOTT,
Secretary.

Where Does Heat Go?

Of the total amount of heat energy represented by the coal fired in a boiler furnace, only from 6 to 15 per cent. is obtained in the form of useful work at the belt wheel of the engine. This article shows where and how the heat is lost.



—Bulletin of Abstracts.

HOTEL PENNSYLVANIA

NEW YORK, N. Y.

Headquarters for First Annual Convention and Exhibition of American Gas Association, October 13-18, 1919

First Annual Convention and Exhibition

The January issue of the ASSOCIATION MONTHLY announced the decision of the Executive Board to hold a convention and exhibition in 1919. The date has now been definitely set for October 13-18 and the Hotel Pennsylvania in New York City has been designated as headquarters.

AN IMPORTANT DECISION

The importance which the Executive Board attaches to the calling of a Convention of members of the newly formed American Gas Association, at the earliest suitable date, was clearly evident during the discussion preceding the decision.

There is not only the fact that recent events have affected conditions in both commercial and technical departments of the industry, but we also face the probability that "normal" conditions which are on the point of being established once more will, in all likelihood, be very different from the pre-war "normal" state. In any event, the placing of the gas industry on a solid operating and financial basis, fitted carefully into conditions as they take form during this period of reconstruction, will require not only the thought and attention of men of broad experience and optimistic outlook, but the working together of all gas men for the carrying out of clearly formulated general policies.

The unexpected came upon us suddenly from many points during the short period in which our country was at war. Unprecedented loads were added to gas lines for various factories that sprang up over night; cantonments and new industrial settlements had to be supplied with light and fuel; even domestic consumers turned to us when other fuels failed, and the public set about to readjust its previous service standards to meet new conditions. By-products of gas making became increasingly important as the government and industries manufacturing war essentials built up a demand. Makers of apparatus, too, found themselves working under new restrictions with a question in their minds as to whether these were, after all, entirely a burden. Each one of these facts has presented us with a special problem concerning new methods of manufacture, continued utilization of large amounts of gas, production of and markets for by-products and new commercial policies, not to mention rates and the financial situation.

The gas industry, furthermore, and its individual men, responded so wholeheartedly and worked so efficiently where the government and the public made demands, that there are very strong indications of a new era of good-will which requires only judicious fostering

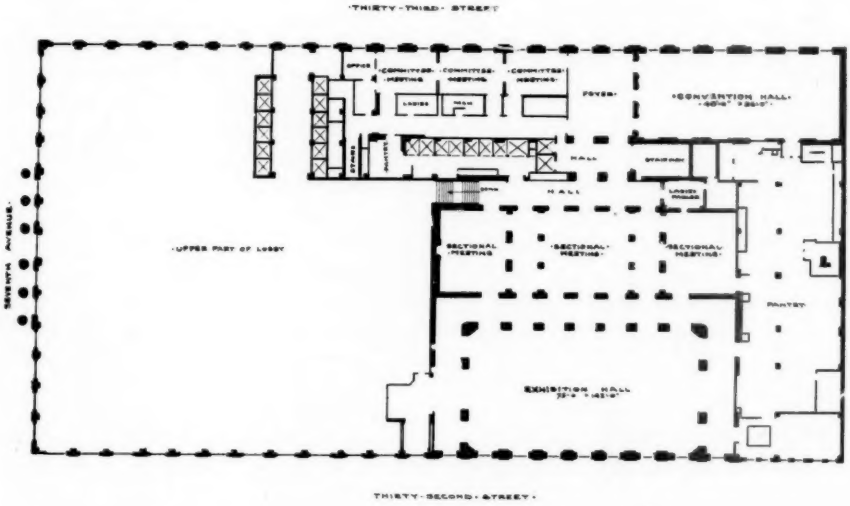
The Executive Board has determined to make possible, through the Convention of October, 1919, a co-ordination of efforts and a co-operation of units for the effective building up of a greater and more solid prosperity for all concerned and an increasingly efficient service for the public. Needless to say, due attention will be given to the possibilities presented by the existence of the new national Association with its organization well-nigh complete and its place as a fully representative society including all departments of the gas interests, firmly established.

The Executive Board has under advisement the personnel of committees on

program, addresses, entertainment, etc., which will be announced in due time.

HOTEL PENNSYLVANIA, NEW YORK

To emphasize the importance of this first annual Convention and Exhibition of the American Gas Association, the Board has designated not only the biggest city of the country as the meeting point, but it has also selected the biggest hotel of the world as headquarters—the newly completed and opened Hotel Pennsylvania, opposite the Pennsylvania Terminal.



The Hotel Pennsylvania has 2,200 rooms, with rates per day varying from $3.00 for single accommodations to $12.00 and up for parlor suites.

Every facility for the comfort of guests is available and the spacious auditorium and small committee rooms make it ideal for the purposes of an association convention.

EXHIBITION PLANS UNDER WAY

A committee consisting of

A. P. Brill, Pittsburgh, Pa.
Mabon P. Roper, Rockford, Ill.
John S. DeHart, Jr., Newark, N. J.
Harry D. Schall, Detroit, Mich.
Sidney Mason, Gloucester, N. J.
W. W. Barnes, Secretary Manufacturers Section

is already at work on the details for the exhibition of gas appliances and apparatus. As shown in the accompanying sketch, the exhibition room occupies an easily accessible position on the convention floor of the hotel. This will be divided in 47 spaces measuring 10 feet by 11 feet 9 inches, 25 spaces measuring 8 feet by 8 feet, and 14 spaces measuring 7 feet by 10 feet (balcony). Only Manufacturer Company Members of the A. G. A. will be allowed to exhibit. As in N. C. G. A. regulations of former years, these spaces will be assigned by lot, and the expenses, now estimated at $75 per space, will be equally apportioned among the exhibitors. Further details will appear in the next number of the Monthly and a prospectus containing all particulars and regulations for the use of exhibitors will be issued within a few weeks. The Secretary of the Manufacturers Section has already received a number of applications for space.

The Exact Case Concerning American Gas Association Memberships

ON June 6, when the American Gas Association was formed by the amalgamation of the N. C. G. A. and the A. G. I., the membership rolls of these two combining organizations stood as follows:

American Gas Institute	
Honorary Members	3
Life Members	2
Active Members	1,137
Associate Members	220
Junior Members	186
Affiliate Members	87
Total	1,635
National Commercial Gas Association	
Company Members	
Honorary Members	1
Gas Companies	183
Manufacturer Companies	118
Individual Members	2,688
Total	2,990

One of the first questions considered by the new Association concerned the status which the members of the dissolving organizations should hold in the American Gas Association.

The amalgamation broke into the fiscal years of both old associations. With this in mind and to allow all a margin of time in which to determine under just what classification they desired to register, "all members of the A. G. I. and the N. C. G. A., in good standing at the time of the organization of the Association, were automatically made members of the American Gas Association" (Article III, Section 5, Constitution).

No dues, additional to those paid by members to the old associations, were assessed for the period from June 6 to September 30.

Inasmuch as the classification of membership in the American Gas Association is somewhat different from that adopted by either of the old associations, the members of the former organizations were requested to sign enrollment blanks of the new Association, designating the section or sections which they wished to join.

Many of the former A. G. I. and N. C. G. A. members complied with this request at once and they are now properly allocated in the different sections.

It is felt that many of those individuals from whom we have not heard, failed to send in their enrollments because they understood that they automatically became members of the American Gas Association without the necessity of sending us any notification concerning their status in the new organization. While this was theoretically true, in actual practice it did not give the Association headquarters the information necessary to place the individual in the sections he might select. In addition to this, consideration must be given to a provision of the Constitution which requires all active members, *not* employed by company members of the A. G. A., to pay annual dues of $15.00, whereas employees of company members have the privilege of joining one or more sections, on a pro-rated scale.

Therefore, those members of the old associations who have not yet notified Association headquarters concerning

their membership in the American Gas Association are urged to do so at once in order that they may continue to receive the literature of the Association and properly take their places in the various sections.

CLASSIFICATION OF COMPANY MEMBERS

Gas company members, accepted as such, pay dues for each year according to their declaration of gross annual sales of gas for the calendar or fiscal year previous. The sum is computed on the basis of $10.00 plus 1/30 of 1 per cent. for gas sales up to and including $2,000,000, plus 1/50 of 1 per cent. of gross sales over $2,000,000.

Manufacturers will be accepted as company members in any one of five classes, depending upon gross annual revenue derived from the gas business.

MANUFACTURER COMPANIES

Class A—Under $50,000 gross annual revenue derived from the gas business during the previous calendar or fiscal year —per year $10.00 plus.....$20.00

Class B—From $50,000 to $250,000 gross annual revenue derived from the gas business during the previous calendar or fiscal year—per year $10.00 plus...$90.00

Class C—From $250,000 to $750,000 gross annual revenue derived from the gas business during the previous calendar or fiscal year—per year $10.00 plus..$190.00

Class D—From $750,000 to $1,500,000 gross annual revenue derived from the gas business during the previous calendar or fiscal year—per year $10.00 plus..$290.00

Class E—Over $1,500,000 gross annual revenue derived from the gas business during the previous calendar or fiscal year—per year $10.00 plus.....$490.00

Holding or operating companies of gas and manufacturer companies are enrolled in one class only, with dues of $100.00 per annum.

CLASSIFICATION OF ACTIVE MEMBERS

Individual members who are in the service of a company member and endorsed by their employer, may belong to one or more sections of the Association, according to their choice. The dues are:

$5.00 for membership in one section
$7.00 for membership in two sections
$9.00 for membership in three sections
$1.00 for membership in each additional section

Individual members who are not connected with company members must pay annual dues of $15.00 covering registration in all sections.

PRIVILEGES AND DUTIES OF COMPANY MEMBERS

In addition to the general advantages and benefits to be derived from membership in the Association, and as the results of its activities, each company member of whatsoever class has the privilege of appointing one delegate who shall have a vote in the Executive Session of the Association, as well as in all general and sectional meetings. This provision gives the company member a voice in the approving of new company members, in the electing each year of eight directors of the Association and in the electing of a committee of six members, whose duty it shall be to nominate the officers who are proposed for election at the next annual meeting.

Through its delegate, the company member thus keeps a controlling finger on the most important centers of authority vested in the Association, as well as on its general activities. For instance, the committee which he elects, nominates the officers who make up the Executive Board, which, in turn, controls the affairs of the Association, including its finances and all of its activities. Fifty company members, by a written request, may call a special Executive Session of the Association to consider a special subject or they may designate nominees for Association officers, not named by the committee.

Company members are entitled to copies of all general publications issued

by the Association and to such other material as the Executive Board may, from time to time, designate.

INDIVIDUAL MEMBERS

Individual members have control over the sections to which they belong, through the election of chairmen and vice-chairmen. By vote at the General Session of the Association they approve new individual members and elect President, Vice-President, and Treasurer of the Association. They also have the privilege of taking part in discussions of interest to the industry and of receiving the Association MONTHLY and all literature of the sections with which they are connected.

The present membership of the A. G. A. stands as follows:

Company Members	
a. Gas Companies	264
b. Manufacturer Companies	91
c. Holding Companies	9
Total Company Members	364
Individual Members	
Accounting	586
Technical	860
Commercial	864
Manufacturers	527
Total Individuals	1,372

All gas companies that have not enrolled as company members are urged to do so, thereby enabling their employees to select membership in the section or sections in which they may be particularly interested; the employees of non-company members must belong to all sections and pay dues at $15.00 a year.

Managing Committee---Commercial Section In Important Meeting

THE Managing Committee and Chairmen of Committees of the Commercial Section held a joint meeting at Association Headquarters on Tuesday afternoon, February 11, 1919.

Those present were: E. N. Wrightington, Chairman; W. J. Clark, C. M. Cohn, R. C. Congdon, O. T. Knight, F. J. Rutledge, J. D. Shattuck, Thomson King, R. S. Doull, J. P. Hanlan, G. S. Barrows, Louis Stotz, W. A. Ehlers, and Jansen Haines.

INDUSTRIAL FUEL COMMITTEE

The Managing Committee approved the revision of the Industrial Fuel Committee and the following members were appointed: Thomson King, Chairman; F. A. Tuttle, H. H. Clark, W. W. Cummings, H. O. Loebell, Bruno Rahn, H. L. Read, S. T. Willson, I. Lundgaard, H. von Vittinghoff, E. B. Myers, W. T. Rasch, F. F. Cauley L. B. Richards, C. A. Schuldt, James F. Reynolds, Wm. Berry.

The report of the Chairman of the Industrial Fuel Committee was then presented (see page 55) and followed by a thorough discussion, in the course of which it was decided that the services of Mr. W. A. Ehlers, as Industrial Fuel Engineer of the Association, be available only to company members and on a rate basis identical with that used by the N. C. G. A. for such services. Mr. Ehlers, it was decided, shall at this time make work in the field his first concern, with whatever interims there may be, employed at headquarters in the preparation of pamphlets and other material for promoting the industrial use of gas.

The Committee agreed to recommend to the Executive Board that an appropriation of $1,000 be made available to the Industrial Fuel Committee for the

carrying out of such special work as the testing and development of gas appliances, etc. The need for a laboratory where appliances for special purposes might be developed received special emphasis.

The Chairman of the Industrial Fuel Committee was instructed to prepare a definite recommendation concerning a course or courses in industrial fuel and the advisability of the Association's undertaking their preparation.

SALES DEVELOPMENT COMMITTEE

The Managing Committee approved the appointment of the following additions to the Sales Development Committee, of which J. P. Hanlan is chairman: H. N. McConnell, Fenton Kelsey, R. Kidde, P. B. Wiske, Lee H. Newbert.

Mr. Hanlan made a verbal report concerning the work of his Committee in preparing a paper for the March Conference (see page 57), and outlined the general plans of the Committee to encourage increased appliance sales and the organization of self-supporting or profitable sales departments in gas companies. One of the special considerations of the Committee is the formulation of a system of remuneration for salesmen that will suit both employee and company.

This Committee will also deal with such matters as the means of educating consumers to make minor adjustments on gas equipment.

ILLUMINATION COMMITTEE

The Managing Committee approved the appointment of the following Illumination Committee: C. O. Bond, Chairman; Dr. Howard Lyon, C. A. Luther, F. V. Westermeier, C. E. Reinicker, W. G. Hoyt, J. P. Conroy, J. C. D. Clark, J. J. Burns, John A. Doyle, James Ferrier, Geo. W. Allen.

HEATING COMMITTEE

The Managing Committee approved the appointment of the following Heating Committee: Geo. S. Barrows, Co-chairman; W. W. Cummings, Co-chairman; Thomson King, Geo. E. Bennitt, C. L. Bryant, J. J. Burns, Chas. O. Frary, W. H. Taylor, R. Kidde, F. S. Wade, C. C. Winterstein, E. V. Daily, A. H. Humphreys, L. B. Newbert, E. J. Burke.

Mr. Barrows stated that a report was being prepared and that one of the most important subjects to be considered was the attitude of gas companies toward the taking on of a heating load. It was agreed that definite data must be obtained before conclusions could be reached on such matters.

RELATIONS WITH ARCHITECTS, CONTRACTORS AND DEALERS

The names of B. Olsen and Lee H. Newbert were added to the approved list for this Committee. The Committee will make an immediate attempt to establish relations with the American Institute of Architects.

As suggested, Mr. Doull will also give attention to the establishing of co-operative relations with plumbers and steam fitters.

WINDOW AND SHOW ROOM DISPLAY

A committee consisting of S. H. Alexander, Chairman; Lawrence A. Heiss, John R. Fenniman, T. W. Leviness, was approved. The Committee has decided, with the approval of the Managing Committee, to furnish to member companies, without charge and to non-member companies at a price to be determined, a monthly window decorating service of four original displays. In addition, window screens, posters and other materials will be prepared and offered from time to time.

Before adjourning, the Committee recommended that the scope of the Committee on Industrial Codes include such considerations as the possibility of legislation directed against gas companies because of improper installations, such as heating stoves and boilers under wrong conditions, made often by other agencies.

Report of Industrial Fuel Committee

AT the meeting of the Managing Committee of the Commercial Section, which was held on February 11, 1919, at Association headquarters, the program of the Industrial Fuel Committee and a report presented by Mr. Thomson King, Chairman, received special attention.

The outline of the policies which will govern the Industrial Fuel Committee's work as well as activities which it hopes to undertake during the course of the year is as follows:

I. To determine upon a general policy to govern and direct the activities of the Committee and to define the scope and limits of its activities and authority.

II. To exercise supervision and direction over the work of the Industrial Fuel Engineer.

III. To secure suitable papers on industrial fuel subjects to be presented to the convention of the Association and in its MONTHLY.

IV. To recommend to the Association whatever action seems necessary on industrial fuel questions.

V. To carry on investigations concerning the application of gas to industrial processes.

VI. To investigate appliances and systems offered by manufacturers for use in connection with industrial fuel work.

VII. To determine unit cósts for the production of work by means of industrial gas and to determine the relative cost for production of the same work when competitive fuels are used.

VIII. To seek out and recommend improvements in the design and construction of existing gas consuming appliances and in methods of their application.

IX. To make public and available to the gas industry the results of its investigation.

X. To prevent, as far as possible, the sale of inefficient and incorrect gas consuming appliances, and the dissemination of incorrect and misleading information, and to standardize the industrial fuel work of the gas industry along the most efficient lines.

TENTATIVE PROGRAM OF WORK FOR THE CURRENT YEAR

The division of the Committee into Sub-committees, to consist of three to five men each.

A. Committee on the improvement of atmospheric burner design and application—to investigate general types of atmospheric burners now in use for industrial application, to note their faults and deficiencies and to propose and define changes in design and application to overcome these. The term "burner" is to be understood to include the gas orifice, air mixer, mixing tube and burner proper.

B. Committee on proportional mixing of gas and air—to consider and report on various ways of mixing gas and air, other than the atmospheric mixer, and to determine by theory and test the effect of good and bad mixing; to consider and report on the question of the positive pressure blower versus the centrifugal fan as a source of air blast, and in detail, on various systems of high pressure gas, one pipe systems, etc.

C. Committee on performance standards—to establish specifications to cover the performance of simple furnaces and possibly other industrial gas appliances whose performances admit of standardization (provided a man able and willing to carry on the work can be found).

D. Committee on cost data—to collect accurate records of the unit cost of production by means of gas heat as applied to various industrial processes, to present this data in such form that it may be of the greatest use to industrial fuel men throughout the gas industry, and to work out and present

a standard form for the report of unit costs; to collect data on the advantages, disadvantages and costs of the various fuels competing with gas in industrial processes.

In reporting the progress of the Industrial Fuel Committee, Mr. King stated that the first meeting of the Committee had been held on February 7, at Association Headquarters with the following men present: H. H. Clark, Chairman; W. M. Cummings, H. O. Loebell, H. L. Read, S. T. Willson, H. von Vittinghoff, E. B. Myers, W. T. Rasch, and L. B. Richards (in place of W. C. Buell). Besides the above mentioned members of the Committee, Mr. Louis Stotz and Mr. Wm. Ehlers were present.

As a result of the deliberations of this meeting, it was agreed to make the following recommendations to the Managing Committee of the Commercial Section:

That Mr. Ehlers occupy what time he is able with the dissemination of information regarding gas as an industrial fuel, through various methods of publicity suitable for reaching the manufacturers and other persons who carry on industrial processes requiring heat; that this activity be especially directed toward the preparation of articles to appear in trade journals other than gas, and of pamphlets on the application of gas to specific industries; that Mr. Ehlers' services especially be made available to gas company members that may desire assistance in the field. Mr. Ehlers will offer them the benefits of his experience or put them in touch with the proper committees of the Association and industrial fuel men among other company members;

That, if need arises, one or more industrial gas engineers be employed to assist in carrying on field work;

That the educational work of the Association, as applied to industrial fuel, be continued with, however, a revision of material and plan to take care of both beginners and more experienced men. To this end it was suggested that a junior and a senior course be arranged and that the material be put into such form that it could be used by a class leader as a lecture;

That a fund of $1,000 be made available for expenses necessary for carrying out the work outlined for sub-committees.

In closing his report Mr. King remarked:

"We feel that there is a tremendous amount of most important work to be carried out during the current year. One of the greatest needs is the education of industrial gas men themselves, so that they may realize the extent and possibilities of the application of their product. During the war, many companies that considered a customer who used a million feet of gas a month as a large consumer, acquired customers whose use ran into a million per day and more. One of the lessons of the war should be that this business can be carried in peace times and that it is the large industrial firm which is the most profitable and most important field from which our companies can derive business and revenue.

"In beginning our Committee work, we are fortunate in having as a foundation on which to build, data collected and reports made up by the preceding committees of the A. G. I. and N. C. G. A. This data will be revised and enlarged upon and made available to our companies as soon as possible.

"In conclusion, we would request that our member companies give to the work of the Committee their hearty and active support, especially by allowing their industrial fuel men the time to attend committee meetings and to carry on the work assigned to them. The activities of the Committee as outlined will require conscientious and arduous work if they are to be carried to a successful conclusion, and we feel that the results that can be obtained will, by their value to the industry, much more than repay the work and effort that must be put into them."

Iowa District Gas Association

The Iowa District Gas Association, in accordance with the decision of its officers and council at a recent meeting, will hold its Fourteenth Annual Convention at Lincoln, Neb., May 21-22, 1919.

Local arrangements will be in charge of Mr. J. E. Harsh, Manager of the Lincoln Gas & Electric Co. Mr. C. N. Chubb, General Manager of the Peoples Light Co., of Davenport, Iowa, has been appointed chairman of the Program Committee.

Sales Development Committee Prepares Paper for March Conference

ON January 20, Mr. J. P. Hanlan, Chairman of the Sales Development Committee, sent out, through the headquarters' office, an important letter and questionnaire for the gathering of data for use in the preparation of a paper for the Conference to be held on March 13-14 at the Hotel Astor, New York.

Mr. Hanlan wrote:

"The Sales Development Committee is scheduled to present a paper on the future sales policies of the gas industry and their justification. To make such a paper both accurate and complete, we must have an expression of intentions and opinions from the many gas interests of the country Therefore, we are asking your co-operation in the preparation of an address that will give the Conference a true understanding of conditions as they are and as they promise to be."

The questionnaire was carefully arranged to make the answering of its items as little burden as possible and yet to elicit definite and significant information.

COMMERCIAL DEPARTMENT

1. Was your commercial or sales department self-supporting in 1918? Did you make any profit or lose money in 1918? In 1917?
2. What will be the policy of your company on this matter during 1919?
3. What is your method of calculating overhead expenses chargeable to the sales department?
4. What is your basis for computing selling prices on appliances?
5. What is your plan for making appropriations for the department?

SELLING FORCE

1. What was the size of your selling force in 1917 and 1918? (Please divide your figures into office and street forces.)
2. Have reductions been due to your men entering United States Service, or to a general policy of retrenchment on the part of your company?
3. Have you attempted to replace employees who did enter the United States Service, and with what success?
4. Do you plan to restore your sales force during 1919 to its pre-war numbers?
5. Considering actual value to your company, do you favor the plan of employing a smaller force of high-grade, experienced salesmen who might cover their territory less often or favor the plan of employing a larger force of men of less sales ability?
6. Based on your own experience, what method of remuneration for sales people do you consider best: straight salary, salary and commission, or straight commission with a drawing account?

COMPETITION

1. Have department stores or other dealers been more active in the sale of gas appliances in your territory in 1918 than they formerly were?
2. Was this due to any inactivity on the part of your company?

FIGURES FOR APPLIANCE SALES

1. In round figures, what were your gross appliance sales for 1917 as compared with 1918?
2. What percentage of the figures for 1917 and 1918 represents office sales?
3. What percentage of the figures for 1918 represents industrial appliances sold because of a war demand?
4. What was the cost, per dollar of sales, to sell appliances during 1917 and 1918?
5. How does the number of appliances sold in 1918 compare with the number sold in 1917?
6. How much of an increase have your sales of cooking appliances to hotels and restaurants, and to factory, industrial and mercantile dining rooms for 1918 shown over 1917?

(*a*) Have you special employees on this work? By what division of your force is it handled?

SERVICE

1. Does your company make a charge for jobbing work such as disconnecting and reconnecting ranges, etc.?
2. If so, on what basis are these charges computed?
3. Did your company undertake the maintenance of gas lighting fixtures and burners in residences during 1916 and 1917?
4. Was it self-supporting?
5. Did you make money on this class of work?
6. What prices did you charge for the work?
7. Was this service carried in 1918?
8. Do you plan to carry it in 1919?
9. Do you believe such service should or can be self-supporting?
10. How do you pay the force engaged in such work?
11. Was this force allowed to sell appliances and materials other than mantles, glassware and incandescent gas lamps?
12. If so, how did you pay these men or women?
13. What, if any, services formerly given free in answer to complaints did you make charges for in 1918?
14. What were these charges?
15. What is your opinion as to the advisability of continuing them?

ADVERTISING

1. What was your advertising (newspaper and general) expenditure for 1918 as compared with 1917?
2. Was your advertising in 1917 largely "direct sales" copy or "good-will and policy" advertising? In 1918?
3. What amount and kind of advertising do you anticipate doing during 1919? How will your appropriation for this purpose compare with pre-war years?
4. What special campaigns did you conduct during 1916-17 and during 1918? (National Gas Lighting Week, Water Heating Week, Gas Range Week, etc., or individual lighting fixture campaigns, special demonstrations, etc.)
5. Do you approve of such national campaigns for 1919?
6. Do you approve of co-operative advertising material prepared by the Association; *e. g.*, thrift folders, canning and preserving circulars, etc.?
7. Would your company *use* a series of educational folders designed to teach consumers to get better service from their appliances?
8. Would your company subscribe, at cost, for such a series of educational folders?

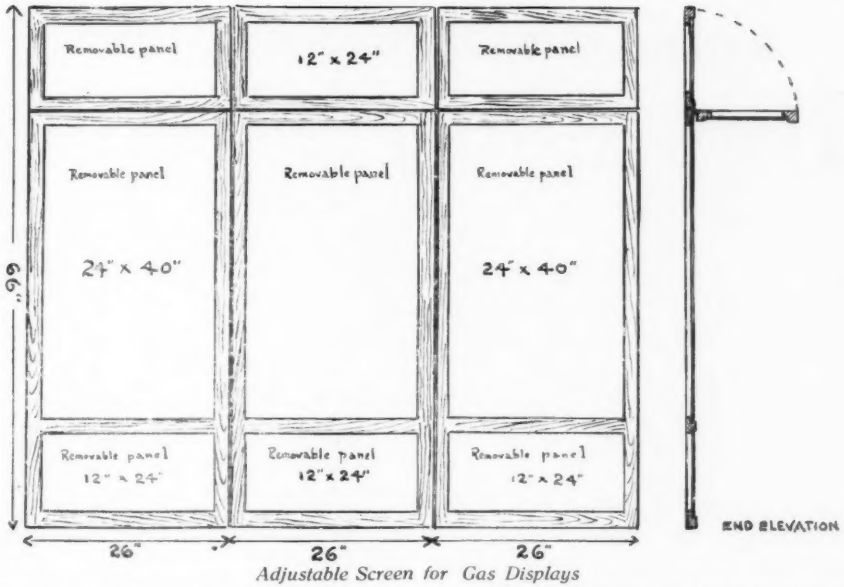
Window Display Committee Offers Free Service

THE Window Display Committee of the Commercial Section, under the chairmanship of S. H. Alexander, the practical designer of window displays for the Public Service Gas Company of New Jersey, has embarked on a program for furnishing to company members, free of charge, four original gas appliance displays each month. These will be printed in the form of pen and ink sketches which have been found, through N. C. G. A. experience, to make better working designs than the photograph. Each sketch will appear on a separate 6½ by 10-inch sheet, with specifications and necessary description, indexed for a permanent file.

To non-member companies, the charge for this service will be $25.00 per year.

It has been found in the past that gas companies are frequently prevented from obtaining the variety in displays necessary for good selling value, through a lack of either time or suitable properties. To overcome this condition at once, the committee has designed a background screen which, in the least possible time, can be set up, knocked down, converted from an ornamental holiday decoration to a plain setting for industrial appliances, or arranged for use as card and picture frames.

The screen is to be offered at $10.00



Adjustable Screen for Gas Displays

for three sections, as shown in the accompanying sketch.

Each section is made of three removable panels of compo-board (fully equipped with braces) framed in a 2-inch, dark finish, wooden frame. The framed top panel on each section is both removable and adjustable, being so arranged on its hinges that it can be dropped into place as a shelf. The sections are joined with removable pin hinges so that any number—from one up—can be used, to suit any design or size of window.

The removable panel permits the inserting of various wall papers, cretonnes or decorative posters, to harmonize with displays of any type, all without the use of paste or tacks. The small panels (12 by 24 inches) are of excellent size for cards, pictures and special reading matter.

It is part of the Committee's plan to supply, at $1.50 each, one special gas poster a month, of size and shape to fit the large center panel. The posters will be in full colors and of a grade that individual companies cannot reproduce at the price.

The interest in better gas window displays and the conviction that in such progress the commercial department is bringing in solid returns for the whole gas company has led the Association to believe that aids for the effective showing and demonstration of gas company merchandise are among the most valuable it could supply.

Hence we are offering:

48 Original gas window designs (four each month)—Free to company members.
1 Three panel window screen (for use indefinitely).....$10.00
12 Original gas posters in colors (each good for more than one display) $18.00

Orders are being accepted now and the Committee promises still further developments in this important field if the support of gas companies justifies the expenditure of Association funds and effort.

Activities of the Manufacturers Section

A MEETING of the Managing Committee of the Manufacturers Section was held on January 27, at Association Headquarters, with Mr. A. P. Brill in the chair.

Mr. Brill appointed Mr. E. S. Dickey to write a paper considering the general condition of the gas appliance market at the present time. This paper will be presented at the American Gas Association Conference to be held in March.

The two matters which occupied the greater part of the Committee's attention were the Exhibition of Gas Appliances and Apparatus to be held in connection with the Convention in October, at the Hotel Pennsylvania, New York, and the details of a membership campaign.

It was decided to classify the individuals and firms engaged in the manufacture or distribution of gas appliances, apparatus and accessories according to the general purposes for which their appliances or supplies are used. Each class would then be assigned to a member of the committee, to whom would be sent a list of the names in the class, and a request that he extend to each a personal invitation to enroll in the American Gas Association. To assist in such a campaign, a prospectus of interest to manufacturers has been prepared and will be mailed directly to each prospect. Each committeeman will receive a supply of application blanks and Association stationery and will be kept in daily touch with results, to avoid possible duplication of effort.

Gas companies will be asked for their co-operation in preparing lists of prospects for the Section and every effort will be made to fill out the rolls before the list of exhibitors at the Convention is closed. In addition to the list which appeared in the 1918 *Proceedings*, the following manufacturer companies have enrolled in the American Gas Association:

By-Products Coke Corporation, W. W. Davis, Chicago, Ill.
James B. Clow & Sons, E. V. Daily, Chicago, Ill.
Eriez Stove & Mfg. Co., Joseph E. Nason, Erie, Pa.
Stanley G. Flagg & Co., Stanley G. Flagg, Philadelphia, Pa.
General Briquetting Co., J. B. McGraw, New York, N. Y.
General Fire Extinguisher Co., George S. Barrows, Providence, R. I.
General Gas Light Co., Hubert A. Humphrey, Kalamazoo, Mich.
Hoffman Heater Co., T. G. Arrowsmith, Lorain, Ohio.
R. Kidde & Co., R. Kidde, New York, N. Y.
Maryland Meter Works, E. S. Dickey, Baltimore, Md.
Peninsular Stove Co., Alfred B. Moran, Detroit, Mich.
Selas Co., Thos. F. Crean, New York, N. Y.
Semet-Solvay Co., L. M. Whitwell, Syracuse, N. Y.
Vesta Gas Range Mfg. Co., F. F. Sparks, Chattanooga, Tenn.

Special Notice

Reservations for hotel accommodations for the week of the Annual Convention, Oct. 13-18, 1919, should be made as early as possible, directly to the Hotel Pennsylvania, 7th Ave. and 32nd St., New York.

Technical Section Activities.

THE Managing Committee of the Technical Section of the American Gas Association met in New York, on Thursday, February 13, with the following members present: J. B. Klumpp, Chairman; D. D. Barnum, E. H. Earnshaw, W. H. Fulweiler, R. G. Griswold, W. Cullen Morris, C. J. Ramsburg, E. C. Uhlig, G. I. Vincent; present by invitation, H. C. Sutton and H. W. Hartman.

ELECTROLYSIS COMMITTEE

The following members of the Electrolysis Committee were selected to represent the Association on the American Committee on Electrolysis:

H. C. Sutton
L. A. Hazeltine
W. C. Beckjord

The American Committee on Electrolysis, which was formed several years ago with Dr. Rosa of the Bureau of Standards and three members from each of the engineering associations to represent the gas, water works, electric railway, and cable interests, will now resume its work which was temporarily interrupted by the War.

A meeting of the "Technical Subcommittee" of the American Committee on Electrolysis was held on February 13 to consider among other things the request of the Bureau of Standards for co-operation in the electrolysis work to which it intends to devote considerable attention. The meeting was attended by H. C. Sutton and L. A. Hazeltine, representing the Electrolysis Committee of the American Gas Association. It was recommended that the American Committee on Electrolysis appoint a sub-committee of five, one representative each from the American Gas Association, the Water Works Association, the Electric Railway Association, the cable interests, and Dr. Rosa of the Bureau of Standards, to co-operate with the Bureau in electrolysis work and the preparation of bulletins which may be issued in this connection.

The Electrolysis Committee of the American Gas Association has prepared a questionnaire which will be forwarded to all company members for the purpose of securing data on damage to gas piping systems, as caused by electrolysis conditions. It is very important that all member companies make full and prompt replies to this questionnaire as the information thus compiled will be of value not only in the preparation of a report but in co-operation with the American Committee on Electrolysis and the Bureau of Standards.

REFRACTORY MATERIALS COMMITTEE

The Committee reports progress in its co-operation with Committee C8 (on testing refractory materials) of the American Society for Testing Materials.

CHEMICAL COMMITTEE

The Managing Committee approved the appointment of the following Chemical Committee:

E. C. Uhlig, Chairman
W. H. Fulweiler
R. B. Harper
O. L. Kowalke
C. E. Lewars
E. G. Love
R. S. McBride
F. W. Sperr, Jr.
C. C. Tutwiler
R. G. Griswold

Arrangements have been made for sub-commitetees of the Chemical Com-

mittee to revise the "Gas Chemists' Handbook" and to submit a report on the "Value of the Chemist to the Gas Industry." The latter report will define the functions of a gas chemist, his possibilities in the development of the gas industry, and the service which he can render to his company.

A sub-committee of the Chemical Committee will be appointed to furnish abstracts of chemical articles that are of interest to gas men. The abstracts after approval by an editing committee, consisting of E. C. Uhlig and E. G. Love, will be published in the American Gas Association MONTHLY.

The Chemical Committee has also arranged to forward a questionnaire to all interested gas companies for the purpose of obtaining a symposium of views on the disposal or utilization of light oil plants.

COMMITTEE ON CAST IRON PIPE JOINTS

The following Committee on Cast Iron Pipe Joints was approved:

G. I. Vincent, Chairman
E. H. Earnshaw
G. T. Macbeth
J. D. von Maur
H. B. Andersen
Gilbert Francklyn

The present committee will devote itself to the preparation of a final and definite specification for the making of joints for cast iron gas mains of all sizes.

COMMITTEE ON CAST IRON PIPE STANDARDS

The committee submitted a report covering standards for hat flanges with revised drawing and table of dimensions, to be substituted for present page 29 of the printed American Gas Institute "Standard Specifications for Cast Iron Pipe and Special Castings."

CONTRIBUTIONS TO MONTHLY

It was decided to appoint a regional committee for securing contributions from company members on technical subjects for publication in the American Gas Association MONTHLY. Technical papers will be submitted to the following Committee on Publications for approval:

W. Cullen Morris
G. I. Vincent
R. G. Griswold

The articles secured by the committee will, as far as possible, reflect the actual developments in the manufacturing and distribution departments of the member companies. Special papers with the approval of the Managing Committee may be prepared on matters of particular importance to the industry.

The following Committees are in process of organization:

CONSUMERS METERS COMMITTEE

The committee will give especial attention this year to standard methods for proof testing consumers' meters.

CARBONIZATION COMMITTEE

The personnel of the committee is practically completed and will include representatives of coal gas and coke oven plant operators as well as of manufacturers of various types of apparatus. Consideration will be given in the committee's report to carbonization through coke ovens.

SUBJECT FOR DISCUSSION AT MARCH CONFERENCE

At the Conference of the Association to be held on March 13-14, matters pertinent to the Technical Section will be considered and chairmen of important committees will be asked to describe briefly the scope of their work. Addresses on the following subjects will be presented:

What Shall be Done with the Light Oil Plants?—Chemical Committee.
Heat Balance of a By-product Coke Oven Plant—F. W. Sperr, Jr.
Heating Economies of the Coal Gas Plan at Rochester, N. Y.

The Managing Committee of the Tech-

nical Section will welcome suggestions from members as to subjects which have special interest for them at this time, in order that the discussions at the Conference may have as much value for the technical man as possible. Such suggestions should be addressed to the Chairman, Mr. J. B. Klumpp, at the office of the Section, 29 West 39th Street, New York, N. Y.

Data Necessary to Secure Mitigation of Bad Electrolytic Conditions

IN sending out the following letter and questionnaire, the Sub-committee on Electrolysis Data has taken the first steps toward remedying a condition of affairs that has become increasingly serious to gas companies as the electrifying of railroads and the distributing of electric current from central stations have extended. The gas companies' mains form excellent conductors of stray currents and the gas company pays for damaged pipes and joints and "unaccounted for" gas.

In order that proper regulations for the prevention of electrolysis caused by stray currents from electric railroads and central station lines may give due attention to the gas company's burden, the committees at work on this question, and the U. S. Bureau of Standards must be supplied with definite data. If you have received a copy of this questionnaire, fill it out carefully and return it to Mr. Sutton at once. If you have not received a copy, use the form as here printed. The essential point is that your experience must be averaged into the general report in order that the proper authorities may be convinced of the gas companies' present burden and also that the proper regulations may be made.

PHILADELPHIA, PA.,
February 18, 1919.

DEAR SIR:

The damage caused by electrolysis to the underground conduits of public utility companies, and particularly to the gas main and service pipes of gas companies, is, in the aggregate, enormous. Some gas companies may be so fortunately situated as not to experience any very great amount of trouble from this source. Many other companies are not aware how badly their particular properties are affected. On the other hand, there are situations where conditions have reached a state that is intolerable.

Much can be done to remedy the conditions and to reduce the amount of damages to the underground structures, but if tangible results are to be obtained, the managements of the utility companies must show a lively interest in any plans which look toward a solution of this problem.

A number of methods for mitigating the damage have been proposed; some to be applied to the street railway systems and others to the piping systems. The gas interests should insist upon a means of mitigation—one that will reduce to a negligible quantity the currents straying from the tracks to the underground pipes. On the other hand, the gas companies should combat any plan for electrolysis mitigation which will increase the flow of stray currents on the gas and water piping systems, particularly a plan for the electrical drainage of gas and water pipes.

It is especially important to obtain data on joint corrosion, which takes place when a current flowing along a main encounters a high resistance joint, and a portion of it leaves the main to flow past the joint, through the surrounding soil.

Of no less importance is the interchange of current between different systems. A high resistance joint in an electrically charged main may cause the current to leave the pipe at a point some distance from the joint, especially where the soil proves to be a better conductor

or where underground metallic structures come in close proximity to the pipe. Other causes than high resistance joints may also shunt a current from a main through other underground metallic structures even when the latter are not electrically drained. Such effects may occur in regions distant from the railway power station.

Some gas companies have had trouble from electric arcs. When a main or service carrying electric current is opened for repair or for the regulation of a gas meter, etc., an electric arc is sometimes formed, and results in the ignition of gas, and a possible explosion.

In the interest of the gas companies who are enduring heavy damage, the Electrolysis Committee is very anxious to obtain data from you concerning the seriousness of electrolysis corrosion in your field.

Respectfully yours,
H. C. SUTTON, *Chairman*,
Sub-Committee on Electrolysis Data,
1401 Arch St., Philadelphia, Pa.

The following data is for the use of the Electrolysis Committee of the American Gas Association:

Name of Company .....
Address .....
City referred to in this report.....
Approximate number of miles of mains with cement joints.....
Approximate number of miles of mains with lead joints.....
Our practice now is to use cement joints on.....mains
Our practice now is to use lead joints on.....mains
Special joints of.....type are used on high pressure mains
Special insulating joints have been used of the following type
.....
.....
Number of corroded services replaced per year.....
Number due to electrolytic corrosion.....
Number of feet of main replaced because of corrosion.....size.....
Number of cases of joint corrosion in recent years.....
Location in reference to railway power station.....
Number located in district where mains are positive to rails.....
Number located in district where mains are negative to rails.....
If electrical measurements were taken, give following data for each case:
Current flow on main.....
Potential drop across joints.....
Potential difference main to track and adjacent cable systems.....
What evidences have you of current flowing on the main encountering a high resistance joint, where the current leaves the main to flow to some adjacent pipe or cable system, where the corrosion is not found directly at the joint?.....
Have you noticed any cases of service corrosion where the gas mains or services are close to water mains?.....
Have you noticed any cases of serious corrosion where the gas mains and services are close to lead cable systems?.....
If an electrolysis survey has been made of your system, please send in with this report data showing the current flow on the mains, potential differences between tracks and main, and any other data you care to send

Are there any electrical connections between the gas piping systems and the railway return? .....

Should electrical drainage of gas mains be permitted as a primary or secondary means of electrolysis mitigation? .....

Are there any electrical connections between the water piping system and the railway system that you know about? .....

Should electrical drainage of water mains be permitted as a primary or secondary means of electrolysis mitigation? .....

Have you had trouble from the rapid corrosion of wrought iron service fittings? .....

Has this taken place principally in locations near railway power stations, where current leaves the service for the rail return? .....

Have you had many cases where an electric arc forms when a main or service is opened or broken? .....

How many times has this resulted in a fire or explosion? .....

Cost of the damage .....

How many cases of fire and explosion have resulted from gas leading from a corroded gas main or service? .....

Cost of the damage .....

Is the leakage of gas from lead joints serious? .....

What is the leakage per mile of 3-inch main in your system? .....

Is the leakage from lead joints more serious in the districts near the railway power houses, where the mains are positive in potential to the rails? .....

State what evidence you have of the electrolytic corrosion of the lead in the joints .....

.....

.....

What pressure has been brought to bear on the railway company to mitigate conditions?

.....

.....

The United States Bureau of Standards has asked for the co-operation of the American Gas Association in the extensive electrolysis work that they are now undertaking. The data concerning the electrolytic conditions on your system will be particularly valuable for the use of the Electrolysis Committee. The Committee will exercise discretion in the use it makes of any data furnished, and in any particular case will be governed by the request of those furnishing the information.

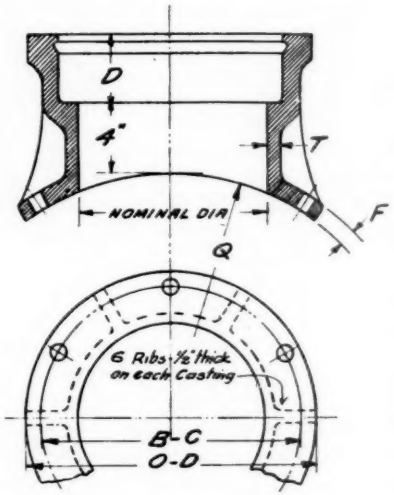
Binders for American Gas Association Monthly

The first volume of the American Gas Association Monthly, the official organ of the Association, began with January, 1919. Every member of the Association, in virtue of his membership will receive a yearly subscription. To make possible the convenient and safe filing of the twelve copies which constitute a volume, the Association has provided a special binder which will be offered at $1.25 each. Your order should be forwarded at once, with check or money order, to A. G. A. Headquarters, 130 East 15th St., New York, N. Y.

HAT FLANGES

NOTICE

Clip out this cut and the table of weights and paste in place on page 29 of your "Specifications."



CORRECTIONS FOR PAGE 29

"Standard Specifications for Cast Iron Pipe"

(A. G. I., 1914)

To the Managing Committee—Technical Section of the American Gas Association:

Your Committee on Cast Iron Pipe Standards has had called to its attention the failure in service of some standard hat flanges. After consideration, it recommends that these flanges be strengthened by the addition of external ribs, and submits a revised drawing and table of dimensions for substitution for the present Plate 22 of the 9½ by 14-inch "In-ko-Grafs" and for the present page 29 of the printed American Gas Institute Standard Specifications, copyrighted in 1914.

Committee on Cast Iron Pipe Standards,
Walton Forstall, *Chairman.*

Approximate weight in pounds
73
97
120
158
72
96
117
156
72
94
116
153
71
93
116
150
71
93
114
150
71
93
113
150

Committee on Cast Iron Pipe Joints

AFTER a thorough study of the work done in the investigation of *cast iron pipe joints* by former committees of the American Gas Institute it has been decided to appoint a committee of the Technical Section on this subject.

It is felt that we now have sufficient data on hand to prepare a final and definite specification for the making of joints for cast iron gas mains of all sizes and the committee at present being organized will attempt to carry this work through to completion. Mr. G. I. Vincent of the Syracuse Lighting Company, Syracuse, N. Y., has been appointed chairman and will appreciate receiving any suggestions or comments from the membership relative to the committee's work.

The following 1917 report of the Committee on Cast Iron Pipe Joints has never been published and is presented as being of interest to our members in connection with the very important subject of standardization.

Cast Iron Pipe Joints

The increasing use of cast iron gas mains to carry pressure up to about 6 pounds has developed an urgent need for information as to the best method of making joints in such mains, particularly in the larger sizes.

In this connection, there is also need for a method of repairing joints in cast iron mains formerly used under low pressure, but now employed as pressure mains.

Your Committee on Cast Iron Pipe Joints has, therefore, undertaken to collect and edit information on this important subject, limiting the inquiry to methods of making joints for medium pressures in cast iron bell and spigot pipe, 10 inches in diameter and larger.

A questionnaire covering all essential points of the subject was sent to forty-three large gas companies situated in all parts of the country. Thirty-one replies were received. Of these, seven companies had no cast iron pressure mains, and four had none over 8 inches.

The following tabulations summarize the answers received.

Pressures

Up to 2 pounds—6 companies
Up to 3 pounds—3 companies
Up to 5 pounds—4 companies
Up to 6 pounds—3 companies
Over 6 pounds—4 companies

Mileage

Companies reporting under 1 to over 20 miles of pipe per size, as classified:

Size of main	Under 1 mile	1 M. to 5 M.	5 M. to 10 M.	10 M. to 20 M.	Over 20 miles
10 in.	—	4	—	—	1
12 in.	1	6	1	3	1
16 in.	1	2	2	7	1
20 in.	—	2	3	—	1
24 in.	1	3	1	—	1
30 in.	—	2	2	1	—
36 in.	1	1	1	1	—
Total mileage all sizes	1	3	3	2	10—19

Kind of Joint

In now laying pressure mains

8 companies use joints of lead wool and yarn, standard bells
4 companies use joints of cement and yarn, standard bells
2 companies use joints of cast lead and yarn, standard bells
2 companies use joints of combination cement and lead wool, standard bells

1 company uses joints of combination cement and cast lead, standard bells
1 company uses joints of combination cement and cast lead, special 6-inch bells
2 companies have no such mains

20

The following joints intended for low pressure are now in use on pressure mains:

8 companies use joints of cast lead and yarn, standard bells
4 companies use joints of cement and yarn, standard bells
3 companies use both cement and cast lead joints
5 companies have no such mains

20

All eight of the companies making their joints with lead wool and yarn state that the joint is giving satisfaction; one company complains of the cost.

Of those using cement joints:

One company (4 miles, 12-inch main, 1 to 2 pounds pressure) reports the joints satisfactory.

Two companies have found cement satisfactory for 12-inch main, but giving trouble in larger sizes.

One company expresses satisfaction with cement joints for all sizes of mains and all pressures.

Seven companies report leaking cement joints in mains converted from low pressure to medium pressure.

The cast lead and yarn joint has only one advocate. All the others find that this joint leaks.

The combination joint, cement and lead wool or cement and cast lead, is satisfactory to the companies using it.

Fourteen companies believe that damaged sub-surface or climatic conditions would not make the joints in use less satisfactory (six companies express no opinion).

Practically all agree that the presence of rock in the main trench would not cause any modification in the character of the pipe joints.

Causes of Leaking Joints

The majority opinion classifies the chief causes of leaking joints as follows: Expansion and contraction; settling strain; improper material; workmanship; vibration; insufficient lead.

Economy has been the chief influence for the adoption of cement joints; an advocate for cast lead and yarn holds his position on the ground that these joints are the best.

The argument in favor of the lead wool and yarn joint is ably given by the Consolidated Gas Company of New York:

"Until the introduction of lead wool as a jointing material in this country, we had considered the bell-and-spigot cast lead and yarn joint to be the most satisfactory type under our conditions. This, however, had one disadvantage in that the lead, being introduced into the bell in a molten state, contracted in cooling and allowed a gas-way, making it necessary to caulk or 'set-up' the lead at the face of the joint. Caulking was effective for not more than ¼ to ½ inch in depth from the face of the joint and slight settlements or disturbances of the pipe would break the bond between this outer ring of lead and the joint surface and cause leakage.

"Another disadvantage of the cast lead joint was the fact that the molten lead charred and made useless the yarn packing with which it came in contact.

"The lead wool joint is simply the older type of cast lead joint with the objectionable features removed. The lead wool is caulked cold, strand by strand, from the yarn up to the face of the joint, and the lead is in contact with the joint surface for the full depth of the lead space; thus a very much greater settlement or disturbance of the pipe is required to cause any leakage. The yarn is not injured in any way by contact with the metal, and, as a matter of fact, is driven still harder by the caulking of the first few strands of lead wool against it."

The Detroit City Gas Company makes joints of cement and lead wool in standard bells, and gives the following account of its method:

"We use a combination cement and lead wool joint on all mains 12 inches and larger. The bells and spigots are American Gas Institute standard. The pipe is lined up on the bank and three lengths are made up into one section. The spigot is brought home and three strands of yarn are twisted into one rope, which is placed and caulked. Wedges are not used in the joint because each pipe is blocked and wedged securely when lined up. The yarn is driven with a pneumatic hammer at 70 pounds pressure. The joint is then filled with a neat cement as far as the lead groove. Two strands of yarn twisted in one rope are then lightly caulked into the cement by hand. All surplus is cleaned out of the lead groove and the bell. The joint is then left for 24 hours.

"Lead wool is then driven into the joint and two ropes are twisted and placed to be caulked at once. The wool is driven well into the groove and caulked in about the same manner as a cast lead joint with a cold chisel, a No. 1 tool, etc. We use a pneumatic hammer on all lead wool joints, including 12 inches and larger. The pneumatic hammer used on this kind of lead wool joint should have from 75 to 85 pounds air pressure.

"A test is put on for leaks with 25 pounds of air pressure, and joints are tested with soap and water. Caulking three lengths of pipe on the bank before lowering it into the trench saves the digging of two bell holes every 36 feet. Every third joint that is made up in the ditch is the same as the lead wool joint, only cast lead is used instead of lead wool because it is easier to caulk and requires a smaller bell hole. It is intended, however, to make all joints of lead wool, as far as possible.

Detroit City Experiments

"About three or four years ago, before laying some large booster lines, experiments were made with four or five different joints before adopting the combination lead wool joint. Below is the report of the investigation to determine the best method for making joints in 20-inch cast iron pipe with bell and spigot ends.

"Special split fittings were made with bell or hub, having a small removable piece so that an inspection could be made of the joint without disturbing it in any way. Pneumatic hammers were used on all of these joints for caulking, with air pressure from 75 to 85 pounds. The men making the joints had never used caulking hammers. In fact, this experimental work was carried on for two purposes: To try different methods of making up joints, and to furnish a school of instruction for the caulkers.

Yarn and Lead Wool

"In the first joint of yarn and lead wool, the contact between the lead wool and the iron was not good. This was pointed out to the caulkers and the second joint showed a good contact. An endeavor was made to pack the yarn so that when the joint was finished the lead would be a panel of uniform width surrounding the pipe. To insure this, pieces of yarn of uneven thickness from end to end, were rejected; pneumatic hammers were used and the distance of the yarn packing from the face of the bell proved, by measurement, to be the same all around the pipe, before the lead was caulked in. Even then the width of the lead ring in some of the finished joints varied an inch and in none was it approximately the same all around.

"Oiled hemp, such as is used in laying cast iron water pipe, was tried. It packed harder, but when the lead was put in, the section was far from being of uniform width. The oil was forced out of the hemp, along the pipe under the lead and into the lead wool, which made a defective joint.

"The split specials used on this work were fastened together with 1-inch machine bolts. The strain on the bolts was so great when lead wool was used that the threads would strip when the nuts were removed.

Green Cement and Lead Wool

"A joint with the first yarn well driven back was filled with cement and a second yarn put in and driven just past the back of the groove. The groove and space in front were well cleaned out, but the first strands of lead wool then driven against the green cement could not be well packed, for they would drive into the cement, which would crowd out in another spot. No further attempt was made with this method.

Cement Set Before Lead Wool Was Placed

"The next joint was made with cement in the same manner as described above, except that the cement was allowed to set over night before the lead wool was caulked in. When these joints were opened, they showed a well packed mass of lead wool in excellent contact with the iron and extending the right distance back of the groove all around the pipe. The groove was well filled.

Cement Set Before Cast Lead Was Placed

"In the next joint, after the cement had

set over night, the lead was cast and then caulked the same as lead wool. When the joint was opened, the lead did not show as good contact with the iron as the lead wool. The cast lead will drive up against the back of the groove, but not against the front.

Testing Joints

"To test the joints for leaks, four lengths of 20-inch cast pipe were lined up on blocks. With joints of lead wool with yarn backing, tested with air to 20 pounds pressure, no leaks were found. All the blocking except one at each end, about 40 feet apart, was knocked out, and another test showed no leaks. The pipe line was then sprung until it had settled a couple of inches in the middle, but the joints still held tight at 20 pounds.

"Under the same conditions joints made up with lead wool against a hard cement backing, showed no leaks under 20 pounds of air. The blocks, as above, were removed, the pipe sprung up and down 4 or 5 inches and tested at 20 pounds. No leaks were found. It was then rolled off the blocking to the ground, tested and found tight.

"The same tests were made with the joints of cast lead against a hard cement backing. A pressure of a little over 40 inches of water showed no leaks. When the pipe was sprung and tested at the same pressure, a very small leak was found at the middle joint. When the pipe was rolled to the ground, two joints showed very bad leaks. On the middle joint one could see that the lead was separated from the iron.

"The joints tested in the experiments were made up with a backing of cement filled as follows, beginning at the back of the bell:

¾-inch yarn, caulked with air hammer
1¾-inch cement, put in by hand with gloves
½-inch yarn, hand caulked
1½-inch lead wool, caulked with air hammer

"Cast lead joints made in this manner are good, but are not nearly as well packed against the iron, especially in front of the groove, as lead wool joints.

"On two joints, a 3-inch stroke hammer was used; on all others, a 2-inch stroke. Hammers of greater stroke than 3-inch are too heavy for use in a trench. An examination showed that the lead in the groove, when driven under a 3-inch stroke, was partly separated from the rest. It looked as though the later strands were driven under and past the lead in the groove. The men complained that the 3-inch stroke hammer was much harder on their arms and shoulders. Two-inch stroke hammers were adopted."

Experience of Public Service Gas Company

The Public Service Gas Company of New Jersey reports, for pressure mains, of which the company has a very large mileage, the use of combination cement and cast lead joints in special bells.

"We use a combination cement and lead joint on all sizes of main 8 inches and larger. The bells are special, inasmuch as they are made 6 inches deep and have no lead groove.

"After the pipe has been lined up, the first yarn is packed as tightly as possible. The joint is then filled with neat cement so that when driven back with a second yarn there will be left from 1 to 1¼ inches of space from the face of the bell to the yarn. For both the first and second yarns we use six strands, cut to lap about 2 inches. To avoid extra thickness at the lap, three strands at each end are cut 2 inches short. The front and back yarns cut as above and solidly driven, should each occupy ¾ inch depth. This will give 3¼ to 3½ inches of cement in the joint. The cement is allowed to set for 24 hours, or, better, for 48 hours if circumstances permit, and then a ring of lead is cast and thoroughly caulked. For mains up to and including 16 inches, we have found hand caulking to be satisfactory and economical. For larger sizes, we recommend the use of pneumatic hammers, although we have had good success in caulking up to 36-inch pipe by hand. After caulking, the joints are tested for leaks with soap and water and they must be tight under 20 pounds air pressure. It is essential for the success of this joint that the most scrupulous care be taken to clean the lead space of every particle of cement or other foreign matter before the lead is poured. We find it advisable to have a pail of clean water at hand and wash out every bit of cement as soon as the second yarn is driven and before the cement has had time to set and stick to the pipe. If this operation is delayed, it is almost impossible to get the pipe clean.

"Some eight or nine years ago, when we first began using cast iron pressure mains for gas distribution, we experienced a great deal of difficulty with leaky joints. Many of the mains for carrying pressure had formerly been used as low pressure mains. Some had cast

lead joints, but the majority, cement joints, and almost without exception the joints leaked under 5 pounds pressure. After considerable experimenting, we found that a joint made with a combination of cement and lead was reasonably satisfactory, and came nearer to being a permanently tight joint than anything we knew. Our theory is, that a cast lead joint will remain permanently tight if the bell and the spigot can be prevented from moving and can be kept in the same position with respect to each other. In practice, however, such movement cannot be prevented, and we have found that a lead joint caulked and made tight one year would leak just as badly at the end of another year. The worst leaks appeared to be caused by a lateral, or up and down, movement of the pipe which compressed the lead slightly, and left a small space for the escape of gas, usually next to the spigot. To overcome this tendency, it was decided to try making a joint of cement and lead in which the cement would give the joint rigidity and prevent lateral motion, while the lead would make it gas tight. We laid a good many miles of main with this combination cement and lead joint, and with a very fair degree of success.

"In 1912 we had about 3 miles of 20, 24 and 30-inch pipe to lay and we decided to make the bells 6 inches deep, so as to give 3½ inches of cement and about 1¼ inches of lead. Pneumatic caulking hammers were used. All joints were tested under 25 pounds pressure. About half the joints were made with lead wool, and half with cast lead. We found the cast lead joints the most satisfactory. The lead wool was much more expensive, required greater skill on the part of the caulker, and leaks were harder to stop, since nearly all of them occurred between the lead and the inside of the bell. Practically no leaks occurred between the lead and the spigot. The cause was found in imperfect castings. The narrow ring between the lead groove and the face of the bell is all that makes the joint with the lead, and this ring is very likely to be made imperfect by accident or poor casting. With the type of joint we were making, however, there seemed to be no excuse for a lead groove, and we decided to omit it entirely. We were able to have about half the pipe made without any lead groove. The character of the casting on the inside of the bell was greatly improved by the omission of the lead groove, and we had no more trouble with leaks. Since that time all pipe for combination joints has been made with bells 6 inches deep, without a lead groove.

Fig. 1

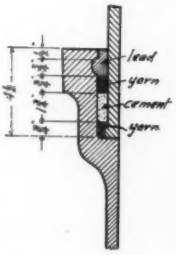


Fig. 2

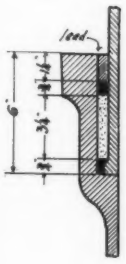
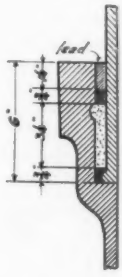


Fig. 3.



"Our early mains for medium pressure were laid with cement joints, and these were unsatisfactory even in 8-inch pipe. In our system of distribution, any main larger than 6 inches is liable to be used for medium pressure at some future time, and we have therefore adopted the policy of making combination joints on all mains 8 inches and over. It may seem inconsistent to make the bells all 6 inches deep irrespective of diameter of pipe. Our reasoning is that we cannot hope to make the bells on large pipe deep enough to give the same resistance to longitudinal strains that we are able to get in small pipe, and we have therefore contented ourselves with a bell that will hold enough cement to resist lateral strains.

"In the special bells that we have been using, the extra depth is obtained by lengthening the shank of the bell, as shown in Fig. 2. We now believe that a stronger and better joint will result if the standard bell is deepened by the method shown in Fig. 3. In this case the lead groove is retained, but is filled with cement. The sketch shows a bell for 16-inch pipe with 1½ inches added to make it 6 inches deep and it will be noted that the 2-inch space between the end of the bell and the lead groove is not enough to make sure that the groove will always be completely filled with cement. This space should be at least 2½ inches and therefore the bell as shown in Fig. 3 should be made 6½ inches deep instead of 6 inches.

"By retaining the groove and filling it with cement we would greatly increase the power of the joint to resist the strain of temperature change, since we would gain the shearing strength of the cement filling the groove.

"From the data available we may take the strength of the bond between the cement and the iron as 400 pounds and the shearing strength across the lead groove as 2,500 pounds per square inch. The total strength of the cement bond as shown in Fig. 2 would then be 75,000 pounds while the addition of the cement filled groove as shown in Fig. 3 would bring the total strength up to 166,000 pounds.

"The stress set up in a 16-inch joint for a change of 1° F. is 3,625 pounds, so that the strength of the joint without groove is equal to a temperature change of 20°, and with the cement filled groove, to 45°."

Repairing Leaking Joints

Nearly everybody reports leaking joints on pressure mains laid originally for low pressure and the usual method of repair seems to be to dig out an inch or more of the old jointing material, lead or cement as the case may be, and re-fill with lead wool caulked with pneumatic hammers. This method is reported as giving entirely satisfactory results.

The Milwaukee Gas Light Company states:

"In addition to using extra care in making our joints (which on all mains above 12 inches are now made with lead wool driven with pneumatic hammers) we use a special type of cast iron pipe joint clamp, devised by us and made from our own patterns with a square braided flax packing laid up in soap heavily compressed against the face of the lead. We have been using this clamp for about seven years and have never had a leak on a joint protected by it. We seldom, if ever, find a leak on a joint in which the lead has not been displaced, either laterally or longitudinally. The joint clamp absolutely prevents longitudinal displacement of the lead, and if a little lateral displacement of the lead takes place from irregular settlement, our experience leads us to believe that the packing will prevent any leakage. We have been singularly free from trouble on the joints of old 12, 16, 20 and 24-inch mains laid twenty years or more ago for low pressure work, when booster pressure has been placed on them. Such troubles as we have had are largely local, due to settlement through excavations for sewers, etc., and through expansion and contraction at points where considerable temperature differences have occurred. Wherever we find it necessary to repair one of these old joints, we drive the lead back and unless there is evidence of a soft joint, simply fill out to the face of the bell with lead wool and put on a clamp. On all new lines the clamp is installed as a part of the original work.

"This is expensive, but perhaps not more so than other schemes which have been suggested and tried. It is very effective and we believe as nearly permanent as anything else of which we have knowledge."

The Elizabethtown Gas Light Company of Elizabeth, N. J., uses Dresser clamps and reports as follows:

"The regular low pressure joints on our 10-inch main were, upon conversion to high pressure, reinforced by Dresser clamps with rubber gaskets. After a few years the rubber gaskets became bad by contact with the gas (water gas) which leaked through the joints, and were replaced by asbestos gaskets which appear after 3½ years to hold the gas satisfactorily."

Still another method has been adopted by the Public Service Gas Company of New Jersey:

"After converting mains from low to medium pressure we found that practically all joints, whether lead or cement, leaked when subjected to a pressure of 5 pounds. Applying the principle of the combination joint to the repair of leaking cement joints, in many

cases we chipped out about an inch of the cement and filled this space with poured lead, caulked tight. This gave usually a fairly satisfactory repair, although sometimes we found that the joint had been poorly made in the first place, and did not contain enough cement to give the necessary rigidity. In the case of lead, it was useless merely to caulk the joint, and usually it was impracticable to cut out the lead and make a new combination joint. We therefore conceived the idea that rigidity could be imparted to the joint by using a split sleeve over the bell, the space between the sleeve and the pipe being solidly filled with cement. In the joints thus repaired, the lead is first thoroughly caulked so as to make a gas tight joint, and the sleeve is then applied to give rigidity and prevent the movement that would otherwise cause the joint to leak. The principle involved is exactly the same as for the ordinary combination joint, except that in one case the cement is placed within the bell and in the other case, outside of it.

"We have used this sleeve method on mains from 6 to 20 inches inclusive, and so far, with absolute success. We have yet to learn of a joint found leaking after the split sleeve has been applied.

"We have also used a split sleeve where an unsuccessful attempt has been made to repair a joint by cutting out a part of the cement and putting in a lead cap, and in such cases the application of the sleeve has resulted as successfully as in the case of an original lead joint."

Tentative Conclusions

The answers to the questionnaire do not point conclusively to one method of making joints distinctly better than any other.

It is clear, however, that neither cement alone, nor lead alone, has proven satisfactory for pressure mains, especially in the larger sizes of pipe. There have been notable exceptions to this experience, but in the great majority of cases, the statement holds good.

Four types of joints have been used with success, namely:

1—Lead wool and yarn, standard bells.

2—Cement and lead wool, standard bells.

3—Cement and cast lead, standard bells.

4—Cement and cast lead, special bells.

Summarizing the apparent advantages and disadvantages of each type, we find:

1—*Lead Wool and Yarn, Standard Bells*

This joint seems to be used by more companies than any other, and there is no doubt that if skillfully made, it will give good satisfaction. It is probable that where street conditions require unusual joint flexibility, the lead wool and yarn joint should be selected in preference to a more rigid joint.

Its disadvantages are: Heavy cost of lead wool in comparison with cast lead; necessity for pneumatic caulking tools, requiring the use of extra large bell holes and the maintenance of equipment for supplying compressed air; the probability of an unsatisfactory joint and the great danger of splitting bells unless the caulkers are skilled and experienced men.

2—*Cement and Lead Wool, Standard Bells*

This joint is not as flexible as the former type, but the use of cement gives a more solid backing against which to drive the lead wool and enables the caulker to make a better joint with the use of less lead wool. Usually 1½ inches of lead wool is used as compared with 2 inches in joint No. 1. The depth of cement possible in a standard bell is not sufficient to give entire rigidity to the joint, but the result is good and the joint is being used very successfully.

Its disadvantages are the same as listed for joint No. 1.

3—*Cement and Cast Lead in Standard Bells*

This is a less expensive modification

(*Continued on page 78*)

Figures on Gas Manufacture

THE mechanical and technical perfection of the West Station gas producing equipment is of such character that it should be possible to account almost pound for pound for all the raw material used. A number of months ago, with some trepidation, we calculated a weight balance, taking a ton of gas coal as the working unit. The result seemed so reasonable that the next month we tried it again, with similar success.

The interesting feature is that whereas the production results, or yields, vary from month to month within fairly wide ranges, the total weight of materials accounted for per ton of coal carbonized shows slight variation.

The following tabulations are based on monthly inventory figures for the past five months:

The weights here given are based as follows: gas = 0.45 sp. gr. (air = 1); coal tar = 9½ pound/gallons; light oil = 0.96 sp. gr. (water = 1).

H_2S in grains per cubic foot as determined periodically at inlet of purifier, reduced to pounds. Moisture is the per cent. moisture in the coal as charged into the retorts, obtained from daily tests.

During November and December, the benches were steamed during the latter part of each carbonizing period. No attempt is made in the above calculations to determine the amount of steam used as a base weight of raw material to be added to the coal carbonized.

The unaccounted for balance includes chemically formed moisture, sulphur absorbed in ammonia liquor and liberated at the still, carbonic acid absorbed in ammonia liquor and purifying material, carbon deposited in the retorts, and all the possible plant losses.

It would seem, therefore, that the low unaccounted for percentage shown during November and December is partially

YIELDS—PER TON OF COAL—1918

	Aug.	Sept.	Oct.	Nov.	Dec.
Gas—Cubic feet	11,043	10,679	10,734	10,684	10,804
Ammonia—Pounds	6.03	5.75	6.10	5.77	5.47
Coal tar—Gallons	13.03	13.32	13.22	11.67	10.6
Coke—Pounds	1,394	1,400	1,400	1,478	1,472
Light oils—Gallons	.24	.36	.38	.23	.22
Hydrogen sulphide—Grains per cubic foot	4.50	4.50	4.50	4.81	5.25
Moisture—Per cent.	.25	.49	.34	.32	.35
WEIGHTS—POUNDS PER TON					
Gas	375.46	363.09	370.32	368.18	372.74
Ammonia	6.03	5.75	6.10	5.77	5.47
Coal tar	123.79	126.54	125.59	110.87	100.70
Coke	1,394.00	1,400.00	1,400.00	1,478.00	1,472.00
Light oil	1.91	2.88	3.07	1.84	1.76
Hydrogen sulphide	7.09	6.86	6.90	7.63	8.10
Moisture	5.00	9.80	6.80	6.40	7.00
Total	1,913.28	1,914.92	1,918.78	1,978.69	1,967.77
Per cent. accounted for	95.66	95.74	95.99	98.93	98.39
Per cent. unaccounted for	4.34	4.26	4.01	1.07	1.61

the result of steaming the retorts without making proper allowance for the steam used. The previous figures of 4 per cent. and higher seem more plausible.

At present we are steaming each bench for 1 hour and 35 minutes at the end of each carbonizing period, using steam at 35 pounds gauge pressure and passing it into the retorts through apertures 5/32 inch in diameter. Applying Napier's formula (for simple calculation) $W = \frac{F P_1}{70}$, in which W = pounds steam per second; F = area of opening in square inches; P_1 = initial pressure (absolute), we are using 95 pounds of steam per ton of coal carbonized.

Thus our raw material becomes 2,095 pounds as the unit weight instead of 2,000 pounds. The total efficiency then in November and December was actually 94.45 and 93.97 per cent. respectively.

Assume, however, that regular operation would have produced for November and December results equivalent to the average of the three previous months, *viz.*: 95.97 per cent. or 1,919.40 pounds per ton of coal. The average recovery in these two months was 1,973.23 pounds per ton. The difference between these two figures then, previous assumptions being true, should represent the production attributable to the steam; *i. e.*, 53.83 pounds product from 95 pounds steam, or a productive steam efficiency of 56.7 per cent.

Just where the products due to steaming appear is not evident without further investigation.

Since 1907 records have been kept to show the annual gas load factor, or the ratio of total gas production to maximum day. Obviously, high peaks and low valleys in daily sendouts demand corresponding flexibility in production and equipment and decreased operating efficiencies both as to equipment and organization. An ideal condition would be steady daily loads in which case the ratio above referred to would be 365. Eliminating, however, Sundays and holidays, which are necessarily valley days in the load curve, a ratio of 350 is the practically perfect factor. The following table shows that our load is gradually stabilizing itself, becoming less seasonable and evidently gaining on the industrial side.

	Max. Daily Sendout		Total Yearly Make	
Year	Date	Cu. Ft.	Cu. Ft.	Ratio
1907	12-24	3,651 M	882,826 M	241
1908	12-24	3,948 M	1,019,095 M	258
1909	12-24	4,602 M	1,123,125 M	244
1910	12-24	4.761 M	1,265,133 M	266
1911	12-12	5,094 M	1,368 447 M	268
1912	12-24	5,527 M	1,523,706 M	276
1913	12-24	5,872 M	1,595,468 M	272
1914	12-24	5,778 M	1,660,835 M	288
1915	12-24	6,197 M	1,688,578 M	273
1916	9-15	7,191 M	1,933,557 M	268
1917	12-10	7,724 M	2,247,650 M	291
1918	9-10	8,763 M	2,558,313 M	292

The close check of the 1917 factor in 1918 is again seen in the fact that the increase in total production and the increase in the maximum day of 1918 over 1917 are nearly identical, being 13.8 per cent. in the first case and 13.5 per cent. in the second.

The table also shows the very substantial growth in our gas business from year to year.

	Increase	
Year	Amount	Per cent.
1908	136,269 M cu. ft.	15.4
1909	104,030 M cu. ft.	10.2
1910	142,008 M cu. ft.	12.6
1911	103,314 M cu. ft.	8.1
1912	155,259 M cu. ft.	11.3
1913	71,762 M cu. ft.	4.7
1914	65,367 M cu. ft.	4.1
1915	27,743 M cu. ft.	1.6
1916	244,979 M cu. ft.	14.5
1917	314,093 M cu. ft.	16.2
1918	310,663 M cu. ft.	13.8

The ten-year period since 1908 shows an increase of 1,539,218 M cubic feet in annual production or 151 per cent. and in eleven years we have increased 190 per cent.; that is, our 1918 production was nearly three times our 1907 production.

—Reprint *Gas and Elec. News*, Jan., 1919
Rochester R. R. & Lt. Co.

AMERICAN GAS ASSOCIATION.

List No. 26—February, 1919.

Rate Increases Secured.

Where information is not secured from company receiving increase, the source of information is noted in brackets. See Cumulative List of February 5, 1919, for explanation of abbreviations. This list includes only increases reported as secured subsequent to February 5, 1919.

IDAHO

Pocatello: P. S. C. grants flat increase of 45¢ per 1,000 CF, effective Dec. 1, 1918, making new rates: 1st 5,000 CF $2.00 per M—next 5,000 CF $1.90 per M—next 10,000 CF $1.75 per M—next 30,000 CF $1.55 per M—all over 50,000 CF $1.45 per M—10 days 10¢ per M. (E. J. 1/4/19.) M. M. Chge. $1.00.

INDIANA

Bluffton: Northern Indiana G. & E. Co. reports old rate $1.10 gross per MCF, $1.00 net, on bills paid 10 days; new rate allowed by P. S. C. effective Jan. 1, 1919, to July 1, 1919, $1.25 per MCF with discount of 10¢ per M, payment 10 days.

Columbus: Columbus Gas Light Co. reports P. S. C. allowed an increase of 2c¢ per M for a period of six months from date, effective Jan. 1, 1919: New rate: 1st 30 MCF gross $1.25, net $1.15 per M—next 10 MCF gross $1.15, net $1.05—next 10 MCF gross $1.05, net 95¢—next 10 MCF gross 95¢, net 85¢—all over 60 MCF gross 90¢, net 8c¢ per M. Old rates: 2c¢ per M less on each gross and net rate.

Decatur: Northern Indiana G. & E. Co. reports old rate $1.10 gross per MCF, $1.00 if paid 10 days; new rate effective Jan. 1, 1919 to July 1, 1919, allowed by P. S. C. $1.15 per MCF. If unpaid in 10 days penalty of 10¢ per M added.

Fort Wayne: Northern Indiana G. & E. Co. reports old rate 85¢ per MCF. P. S. C. allows increase effective Jan. 1, 1919, to July 9, 1919: 1st 10 MCF 93¢ per M—next 20 MCF 88¢ per M—next 20 MCF 78¢ per M—all over 50 MCF 73¢ per M. Rate to all consumers outside of the Corporation Limits of Fort Wayne $1.15 per MCF.

Frankfort: Northern Indiana G. & E. Co. reports old rate $1.10 gross per MCF, $1.00 per M net. New rate allowed by P. S. C. effective Jan. 1, 1919, to Aug. 1, 1919: $1.25 gross per MCF, $1.15 per M net, 10 days payment.

Lebanon: Northern Indiana G. & E. Co. reports old rate $1.10 gross per MCF, $1.00 per M net. New rate allowed by P. S. C. effective Jan. 1, 1919, to Aug. 1, 1919: $1.25 gross per MCF, $1.15 per M net, 10 days.

Logansport: Northern Indiana G. & E. Co. reports old rate $1.10 gross per MCF, $1.00 net 10 days. P. S. C. allows a "War sur-charge" effective Nov. 1, 1918, of 15¢ per MCF. M. M. Chge. 20¢ net per month if meter registers less than 200 CF.

Michigan City: Northern Indiana G. & E. Co. reports old rate $1.10 gross per MCF, $1.00 net per M, payment 10 days. P. S. C. allows new rate effective Feb. 1, 1919, to Sept. 1, 1919: 1st 30 MCF $1.20 per M—next 20 MCF $1.10—next 25 MCF $1.00—next 425 MCF 9c¢—over 500 MCF 85¢ per M—disct. 10¢ per M on 15 days payment. M. M. Chge. 25¢ per meter per month.

Peru: Northern Indiana G. & E. Co. reports old rate $1.10 per MCF, disct. 10¢ per M 10 days. P. S. C. grants new rates as follows: 1st 10 MCF $1.10 per M—next 20 MCF $1.00—next 20 MCF 90¢—over 50 MCF 8c¢ per M—disct. on all bills paid 10 days 10¢ per M. A "War sur-charge" of 15¢ per MCF of gas sold to be added to above rate table. Effective Nov. 1, 1918, sur-charge to continue for period of the war.

South Bend: Miskawaka Districts and Town of River Park: Northern Indiana G. & E. Co. reports old rate $1.00 gross, 90¢ net, if paid 10 days. P. S. C. allows new rate effective Jan. 1, 1919, to July 1, 1919: 1st 10 MCF $1.08 per M—next 20 MCF 98¢ per M—next 20 MCF 88¢ per M—all over 50 MCF 83¢ per M—disct. of 10¢ per M on all bills paid 10 days. M. M. Chge. 5c¢ per meter per month.

Wabash: Northern Indiana G. & E. Co. reports old rate $1.10 gross per MCF, $1.00 net, if paid 10 days. P. S. C. allows a "War sur-charge" of 15¢ per MCF, sur-charge effective Nov. 1, 1918, to continue for the period of the war.

MARYLAND

Baltimore: Consolidated Gas, E. L. & Power Co. reports increase effective Dec. 1, 1918. Domestic and Commercial schedules, secondary rate per MCF 6c¢ gross, 5o¢ net—old rate 45¢ gross, 35¢ net.

Industrial schedule 5c¢ gross per MCF, 50¢ for 1st step of running costs—55¢ gross, 45¢ for next step of running costs—Old rate 45¢ gross, 35¢ net first step of running costs—40¢ gross, 3c¢ net, for second step of running costs.

The rate increase did not affect the primary rate on any schedule applying to secondary rate steps only.

MASSACHUSETTS

Greenfield: Greenfield Gas Light Co. reports P. S. C. ordered effective Jan. 1, 1919, as follows: reduction in regular rate of 1c¢ per MCF making gross rate $1.80 per MCF, net rate $1.70 per M. Industrial rate increased to $1.50 per MCF, gross $1.40 net.

MINNESOTA

Minneapolis: Gas Co. reports old rate: Private consumers 92¢ gross per MCF, 77¢ net. New rate effective Jan. 1, 1919: Private consumers year 1919, $1.10 per MCF gross, 95¢ net—1920, 98¢ gross per MCF, 83¢ net—1921, 93¢ gross, 78¢ net—1922, 89¢ gross, 74¢ net—1923, 85¢ gross, 7c¢ net. Municipal Buildings and Street Lighting 1919, 82¢ per MCF net—1920, 72¢ net—1921, 68¢ net—1922, 64¢ net—1923, 60¢ net. (Report and Valuation, Milo R. Maltbie, E. J. 1/4/19, 151.)

MISSOURI

Brookfield: Gas, Electric & Heating Co. reports Old rate per MCF $1.35 gross, $1.25 net per M. New rate, effective Dec. 5, 1918, 1st 10 MCF $1.60 gross, $1.50 net per M—over 10,000 CF $1.35 gross, $1.25 net per M.

St. Joseph: Gas Co. reports increase allowed by P. S. C. effective Dec. 10, 1918: Old rate $1.00 gross per MCF, $1.00 net. New rate 1st 50 MCF $1.35 gross per M, $1.30 net—next 50 MCF $1.20 gross per MCF, $1.15 net—all over 100 MCF $1.05 gross, $1.00 net. Rates apply to manufactured gas.

NEW JERSEY

Atlantic City: Gas Co. reports P. S. C. allows a second increase of 10¢ on surcharge per MCF, effective Jan. 9, 1919. Present rate is now $1.00 per MCF, less 10¢ per M plus a surcharge of 25¢ per M; and M. S. Chge. based on size of meter as follows: 3 and 5-lt. meter 25¢—10-lt. 30¢—20-lt. 40¢—30-lt. 50¢—45-lt. 65¢—60-lt. 80¢—100-lt. $1.20—150-lt. $1.70.

Toms River: Ocean County Gas Co. reports Old rate $1.35 per MCF gross, $1.25 per M net, plus R. T. S. Chge. 25¢ per month. New rate effective Dec. 6, 1918, $1.55 per MCF gross, $1.50 per M net, plus R. T. S. Chge. 25¢ per month.

Tuckerton: Ocean County Gas Co. reports Old rate $1.60 per MCF flat; New rate effective Feb. 1, 1919, $1.83 per MCF flat.

NEW YORK

Coney Island: Brooklyn Borough Gas Co. reports old rate 8c¢ per MCF. New rate effective Dec. 12, 1918, $1.10 net per MCF. Rate was reduced from 95¢ per MCF to 80¢ per MCF in July, 1916. During litigation to obtain an increase in rate the company charged the former rate of 95¢ per MCF and set aside difference of 15¢ to be returned to the consumer if the court decided against the company. Application for increase to $1.30 now in hands of P. S. C., First District.

OHIO

Cleveland: East Ohio Gas Co. (Natural) reports Old rate 31¢ gross per MCF, 30¢ net. New rate effective Feb. 6, 1919, 37¢ gross per MCF, 35¢ net. Ten year price ordinance effective Feb. 6, 1911, provided rate 1st 8 years 31¢ gross, 3c¢ net, last 2 years 37¢ per M gross, 35¢ net.

PENNSYLVANIA

Butler: T. W. Phillips Gas & Oil Co. (Natural) reports increase effective Dec. 1, 1917. Industrial rate 1st 500 MCF 36¢ per M—next 500 MCF 31¢—all over 1,000,000 CF 30¢ per M—disct. 1¢ per M, 10 days each block. Domestic rate effective Jan. 16, 1918, 37¢ per MCF—disct. 2¢ per M 10 days.

Lewistown: Penn. Central L. & P. Co., second increase allowed by P. S. C. effective Nov. 1, 1918. Base rate $1.20 per MCF all gas sold less discounts 10 day payment—1st 50 MCF 10¢ per M—next 50 MCF 15¢ per M—next 100 MCF 20¢ per M—all over 200 MCF 25¢ per M. R. T. S. Chge. asked for was temporarily denied, P. S. C. desiring scale rate.

Third increase allowed by P. S. C. effective Feb. 6, 1919. Consumption rates remaining as in Nov. 1st increase with addition of R. T. S. Chge. as follows: 3-lt. meter 70¢ per month—5-lt. 75¢—10-lt. 85¢—20-lt. 90¢—45-lt. $1.25—60-lt. $1.50—60A-lt. $2.10.

TEXAS

Atlanta: Gas Co. (Natural) reports Old rate 30¢ per MCF gross, 27¢ net. New rate effective Dec. 1, 1918, 36¢ per MCF gross, 32.4¢ net. Boiler, old rate 10¢ per M, new rate 12¢ per M.

VIRGINIA

Richmond: Henrico County Gas Co. reports Old rate 90¢ per MCF, 95¢ if not paid in 10 days. New rate effective Feb. 1, 1919, $1.00 per MCF, $1.05 if not paid in 10 days. Courts decided Council of Richmond and not State Corporation had jurisdiction in the case.

WISCONSIN

Waukesha: Second increase granted by P. S. C. effective first meter reading subsequent to Dec. 28, 1918. 1st 10 MCF $1.50 net per M—next 15 MCF $1.30 net per M—next 25 MCF $1.20 net per M—next 50 MCF $1.10 net per M—next 100 MCF 95¢ net per M—all over 200 MCF 85¢ net per M.

(Concluded from page 73)

of the lead wool and cement joint and has the advantage of dispensing with labor skilled in the use of pneumatic tools. It also does away with the large bell hole and expensive pneumatic equipment.

Its disadvantages are that, as compared with lead wool, the tightness of the joint depends solely on contact of the lead with the ½ inch of bell surface beyond the lead groove; this maximum of ½ inch is frequently reduced to ¼ inch or less by faulty casting of the pipe; the lead in the lead groove serves no useful purpose and adds nothing to the strength or tightness of the joint.

4—*Cement and Cast Lead in Special Bells*

By special bell is meant, in this case, one without a lead groove and at least 6 inches deep, or else with groove located wholly within the space to be filled with cement. The bell is designed to obviate difficulties experienced in making permanently tight joints with cast lead and cement in standard bells, and to give sufficient rigidity to prevent lateral movement and consequent leaks.

As far as we are informed, only one company has adopted this type of bell, but the results obtained are reported as very satisfactory. It is very desirable to avoid the expensive use of lead wool and pneumatic equipment, and the special bell with combination cast lead and cement joint seems to offer a satisfactory alternative.

E. H. Earnshaw, *Chairman*,
H. B. Andersen,
C. R. Lammert,
A. I. Snyder,
W. H. Taylor,
G. I. Vincent,
J. D. Von Maur.

Educational Department

Conducted by ALFRED E. FORSTALL

COOKING APPLIANCES

DESIGN.—The principles of design of cooking appliances and the details will not be treated in these articles, because of limited space and the relative unimportance of the subject to the average student of gas distribution, as compared with the problems of proper installation and maintenance of appliances. The details of cooking appliance design can be obtained from the standard specifications adopted by the national gas associations.

Mr. H. B. Andersen.

Location.—The location of an appliance should be determined in accordance with the wishes of the consumer, as far as these are compatible with safety and proper operation.

The concentrated products of combustion of a gas appliance should be prevented from striking against any inflammable construction or material. The ordinary range, where the products are discharged horizontally, should be at least 6 inches removed from such construction, unless a baffle is provided or an insulating shield of asbestos and sheet iron. When the products are discharged vertically, the least distance between walls and projecting parts should be 1 inch or more. A range should be placed so that the side or back, or side of the oven is 4 inches or more away from inflammable material, unless insulation is provided. If there is less than 4 inches between the oven bottom and the floor, a foundation of hollow brick, or a hearth of cement or slate, should be laid. The ideal location for a cooking appliance should combine not only the features which have been mentioned, but also ease and cheapness of connection, non-exposure to draught, and inobtrusiveness of appearance.

Needless to say, at this point the appliance to be installed should be thoroughly examined to determine whether it is complete and ready to place in service. If not, the proper steps should at once be taken to remedy the defects.

Piping.—If the appliance is of unusually high consumption rate, a special service pipe may be necessary to supply sufficient gas. Unless the discrepancy is very marked, renewal of the pipe line should not be ordered until an actual test has demonstrated that it is incapable of meeting the demand. This also holds true of the meter and its connections. The piping supplying the appliance will frequently be an independent line from the meter, because the original piping system was not designed to carry a load in addition to illumination. The size of the line will depend on its length and on the consumption of the appliance. One inch for the horizontal and ¾ inch for the vertical portions of the line which supplies the range and circulating water heater will usually be found adequate to insure a proper supply of gas and to permit the addition of a cellar light, and a heating stove on the first floor. When such a line is longer than 60 feet, however, a more accurate check should be

made by a computer, or by using a table like the following. This is designed to permit a maximum pressure loss of 2/10 inch of water between the meter and the appliance.

PIPE CAPACITIES IN CUBIC FEET PER HOUR FOR VARIOUS LENGTHS OF RUN.

Length in ft. Cu. ft. per hour	1-20 Size of pipe in.	21-40 Size of pipe in.	41-60 Size of pipe in.	61-80 Size of pipe in.	81-100 Size of pipe in.
0-100	¾	1	1	1	1
101-150	1	1	1	1¼	1¼
151-200	1	1	1¼	1¼	1¼
201-250	1	1¼	1¼	1¼	1½
251-300	1¼	1¼	1½	1½	1½
301-350	1¼	1¼	1½	1½	1½
351-400	1¼	1½	1½	1½	2
401-450	1¼	1½	1½	2	2
451-500	1¼	1½	2	2	2
501-600	1½	2	2	2	2
601-700	1½	2	2	2	2
701-800	1½	2	2	2	2½
801-900	2	2	2	2½	2½
901-1000	2	2	2½	2½	2½

When the "preinspection system" of installation is used, the preinspector makes the examination and calculation previously described. After he has completed this work he makes a list of the necessary material and originates any other orders which his investigation has found desirable. The material list is given to the storeroom for issue and delivery, and the other orders are properly disposed of at once. When the installation and delivery are being made by one man on a truck, he cares for all the details that have already been explained.

Connection.—In most cases the gas must be shut off in order to make the appliance connection with safety. The fitter should so inform the consumer and if it means extraordinary inconvenience, he should start the fitting work at the appliance and work toward the meter or supply outlet, so that the period during which gas is off, will be as short as possible. Usually, however, it is cheaper and, therefore, preferable to work toward the appliance.

The location of the pipe line and various other points are governed by the necessity for avoiding exposure to draughts, or extremes of temperature, the possibility of accident hazard due to diminished headroom and interference with building or other structures. Piping should, preferably, be exposed and placed parallel or at right angles to walls or floors. Plugged tees instead of couplings should be used where an outlet will be of future benefit to the company. Generally no line cock controlling any individual appliance need be provided, since the meter cock is used for all shut-off work.

Technical details for installing piping will not be treated of in this article. It must be assumed that the workman has been trained in such routine.

Flue Connections.—Most cooking appliances are so located and produce relatively such a small quantity of combustion products, that a flue connection or "stove pipe" is not necessary. However, those appliances which are installed in unventilated places, or which consume gas at a high rate, should be connected with a flue. Since it seldom is possible to provide an independent chimney the connection must be made to an existing outlet.

The following rules, which cover both cooking and other appliances, should govern the installation of a flue.

Blued steel pipe should be used, except in damp places, cellars, and outside buildings, where galvanized pipe is preferable.

The minimum size of any flue connection should be 3 inches. The proper sizes for cooking appliances are as follows:

Ordinary, elevated oven, and cabinet ranges, 4 inches;

Canopy of range, outlet size;

Hotel range and bakers' oven, outlet size.

Each flue connection, except to a range canopy, should include a draft hood which should be placed, for maximum efficiency, about 6 feet above the burner. When appearance demands its installation immediately on top of the flue outlet of the appliance, as in the case of a circulating water heater, it may be so placed.

Generally speaking, a flue connection should be as short as possible. Therefore, the appliance should be placed near the chimney, and the horizontal portion of the connection should be graded as sharply as appearance and headroom will permit. The horizontal pipe lengths should be secured one to the other with rivets or tacks, and the line held in position with wire hangers or brackets.

When two flue branches from the same appliance are necessary, they should be joined, near the appliance, by a Y fitting with one connection to the chimney.

The connection to an existing flue pipe is made by inserting a tee or a Y into the latter. To a masonry chimney it is made by cutting a hole in the masonry, inserting the pipe and building up the hole with plaster.

When a connection is to run through a partition of combustible material, such as of lath or plaster, the latter should be protected by first inserting a sleeve, perhaps of terra cotta, large enough to contain the flue pipe within an annular space of ½ inch. The outside faces should be finished with a collar.

When there is no flue or chimney available with which to connect, the pipe may pass to the outside through the wall, or above an upper window sash, or through one of the panes of glass, if the latter is replaced with metal. After passing outside, the pipe should be extended vertically for a distance of not less than 3, nor more than 10 feet. The lower end of the vertical line requires a capped tee and the upper end a star ventilator, which should be at least 6 inches from the wall.

A damper should be installed in a flue connection only when a thorough test has proved that its absence is unfavorably affecting the draught of another appliance, or permitting the entrance of cold or insects, or the exit of warm air. The damper should have through it a hole 1 inch in diameter. The damper for the flue of an instantaneous water heater should be 1 inch smaller in diameter than the flue proper.

After the connection work has been fully completed, the fitter should turn on the gas and make the usual careful tests to discover any opening or leak. Then he should inspect all parts of his work and proceed to adjust the appliance in accordance with the following rules for burner adjustment. It is also the fitter's duty carefully to instruct the consumer in lighting the burners, especially those in the oven. Then he originates or posts any records that are necessary, cleans up dirt caused by his work, and piles up in a safe place materials to be collected later.

Maintenance.—Visits to maintain domestic cooking appliances are usually the results of requests from the consumer. The most common trouble, an improper adjustment of the air and gas mixture, which results in poor combustion and slow cooking, may be due to a change in pressure since the burner was last adjusted, or to an attempt by the consumer himself to improve conditions, but far more often it is due simply to an accumulation of dirt and grease on the burner top, or in the gas orifice. On some appliances it may be due to the air shutter slipping out of position, a condition which the more modern types have

made practically impossible by the improved air shutter construction.

The complaint man proceeds at once to remedy the cause of the trouble. The top burners of a domestic cooking appliance should be adjusted to a medium hard flame, with a blue cone from ¼ to ⅜ of an inch long. Usually the flame top should be not nearer than 1¼ inches to the top of the grate bars. The oven burners should show a slightly longer and softer flame, and allowance should be made for the fact that the flame softens still further after it has been burning for a short time. A yellow-tipped flame indicating too great a proportion of gas in the mixture, may require the opening of the air shutter to admit more air, or the orifice may need hammering up and then reaming out to the proper size to admit less gas. If the trouble is due to a pressure so low that insufficient air is being entrained, the cause should be located and remedied. It may be a stoppage in the orifice or the burner cock, which can be removed by a wire or reamer, or it may be due to conditions of stoppage, small size, or other defects, in the supply piping, the meter, the service, or the main. Dirty burners are always productive of trouble. They may be the result of an accumulation of grease and dirt in the ports, food boiling over, or the flame flashing back and in burning at the orifice, depositing carbon on the inside of the burner. Sometimes sufficient cleaning can be done with any sharp instrument, but more often a thorough boiling in a soda solution is necessary.

After an orifice has been reamed, the burner cock should be turned on and the issuing stream of gas lighted, in order to be sure that it will be central in the mixer.

An excess of air, evidenced by the flame being too hard, or by its flashing back into the mixer and burning at the orifice, can be remedied by closing the shutter. If an appliance is not provided with adjustable air shutters, the only remedy lies in regulating the gas supply to obtain the proper flame. In many cases it is impossible to do this satisfactorily.

Leaks.—A leak at the joint of a cast-iron burner, and pin holes, or small leaks, at casting defects, can usually be repaired with stove cement. Leaks at other points or of greater extent sometimes require that the whole burner be replaced. A leak at the barrel of a burner cock may be greased or the cock tightened if it is not strained; otherwise, the cock must be replaced. A leak at the burner rail thread may require only rejointing unless stripped threads make a replacement necessary. A cock that is hard to turn may, or may not, leak. Leaks at other points of an appliance are rare, and should be treated as their nature demands. In practically every case a satisfactory temporary repair can be made with soap, which, of course, should be followed as soon as possible with the permanent remedy.

Complete Overhauling.—The replacement of one or more parts, because of accidental damage or excessive wear, may be the only satisfactory way of assuring service. This kind of repair may vary from replacing a small item to completely overhauling the appliance. In the latter case, the work must usually be done in the company's shop, where tools and materials are available. Whenever a complaint man is examining a range and estimating on the cost of repairs, he should pay especial attention to all concealed or interlocking parts, such as linings, burner box, and sheet-iron body, so as to prevent giving a price based on the renewal of a certain number of articles, only to find later, perhaps after

removal to the shop, that others are required.

The complete overhauling of a domestic cooking appliance includes also a thorough cleaning and refinishing and the placing of all parts in first-class condition. The company's shop should be equipped with tanks or vats of such size that the appliance can be completely immersed. This process is as follows:

The appliance is stripped of all removable parts and the skeleton, lifted by a chain hoist running on a monorail ceiling track over the cleaning tank, is completely immersed for from 1 to 5 hours in a saturated solution of lye, heated to about 150° F. by the use of steam coils or gas burners. The smaller parts, such as burners and linings, are placed in a wire basket and immersed at the same time. After the grease and rust has been thoroughly softened, the parts and skeleton are removed, placed on a drain board and cleaned with a wire brush. Then they are immersed in a tank containing hot water, and after being well rinsed, are allowed to dry. The various parts are then refinished, if necessary, before being assembled.

Each man should be encouraged to study the troubles most common to each appliance, and to report promptly anything that may cause bad service or an excessive number of maintenance visits, with a correspondingly increased cost. If there can be any doubt as to whether the trouble has been permanently disposed of, the workman should refer the matter to his foreman for further investigation.

Faulty designs, that is, improper heat distribution, or ventilation, will be found a fruitful source of complaints of poor cooking performance which cannot be reached by ordinary adjustments. In such cases no general remedy can be prescribed, but the matter, if important enough, should be treated by an expert. The best policy is prevention. When a company is active in the sale of appliances and sells only those which have been properly tested in its laboratories and approved, there is little possibility that any appreciable number of really defective appliances will be found in its territory.

Maintenance and Hotel Ranges.—Visits to maintain cooking appliances of the hotel, as opposed to the domestic type, are made either as the result of the consumer's request or in accordance with a standard schedule designed to keep the appliance in good working order. This may necessitate visits as often as once a week, or only once in two months.

The knowledge and the physical work involved in adjusting and otherwise repairing hotel appliances, does not differ from that described in the treatment of the domestic type, except, of course, that the work is usually more difficult and requires a longer time, job for job. The repairs of leaks and of miscellaneous troubles are cared for in the same way. It it often impossible to remove a hotel or restaurant range to the gas company's shop for cleaning and installing new parts, but, fortunately, this is seldom necessary because of the more sturdy construction throughout, and the general tendency of the hotel manager to have repairs made as soon as their advisability becomes evident, instead of waiting until the appliance reaches such a state of unrepair that radical action is necessary.

H. B. ANDERSEN.

Pernambuco Finds Domestic Science School Good Gas Propaganda

Mr. Henry M. Balsam, gas engineer of the Pernambuco (Brazil) Tramways & Power Co., has sent the American Gas Association a most interesting account of the first gas cooking school in South America.

Mr. Balsam evidently got his original idea for the plan early in the Spring of 1918, when the model all-gas kitchen in a pavilion, erected for a local state exhibition, attracted unexpectedly great attention during the demonstrations. At that time Mr. Balsam commented upon the status of gas fuel in Brazil where cheap and abundant wood made a powerful competition. Furthermore, a large number of the kitchens of the country are in charge of the native cooks, who refuse even to consider the possibilities of new methods.

Mr. Balsam writes:

"A properly conducted domestic science or cooking school operated in connection with the commercial department of a gas undertaking, creates for itself a value that cannot be measured in dollars and cents; and even though the immediate returns are satisfactory, it is extremely doubtful whether the expense incurred in the upkeep of such an establishment would be warranted were it not for the ultimate and far reaching results obtained in the form of good-will and a closer relationship with the public. I know of no more lasting or effective propaganda for the gas company than that to be derived from a domestic science school, or lecture course. It is not the brass-band kind that is alive today and forgotten to-morrow, but it works its way into the heart and mind of the public and remains there.

"It was with this in mind that the gas department of the Pernambuco Tramways & Power Co. organized its cooking school, the first of its kind in South America. In its modest way nothing was spared to make it as complete and as perfect an institution as circumstances would permit. The general layout of the demonstration room, with its model

kitchen on an elevated platform, with the necessary equipment and seating accommodations for fifty, is clearly shown in the accompanying photograph. Perhaps I should mention at once that the seating capacity has already been found inadequate and a plan to increase it 100 per cent. is now being considered. In addition to the hall, there is an open air pavilion which serves as a recreation room for the ladies.

"The domestic science course, which we offer, consists of twenty-two lessons to be completed in as many weeks. This may seem, to experts in the United States, an unnecessarily long course but one must remember that conditions generally are very different here in Brazil. Both the housewives and the native cooks know but little of the elements of modern cooking and instruction must of necessity begin at the bottom. The art of cooking itself must be somewhat modified to suit local conditions for the staple food products of Brazil are not entirely like those of the United States. North American recipes, particularly war recipes, have not always found successful application here.

"At each demonstration or cooking lesson, a set of recipes and instructions covering the work for the day are distributed in the form of leaflets that can readily be bound into a permanent booklet at the end of the course. Furthermore, a diploma or certificate is granted to each pupil at the completion of her course. Prizes have, so far, been found unnecessary, for the attendance has been remarkable and but a few students have fallen out. At present there are six classes running at different stages of the course, so that it is quite easy for one to fill in a lost lesson, if necessary.

"I can say with the utmost satisfaction that the plan has worked wonderfully well and has more than surpassed our expectations. The organization of the school would have been almost impossible without the help of Mrs. Balsam, who took the whole matter in hand. She not only organized the course but supervised it and trained Miss Lila B. Porter, the official demonstrator, who is now able to carry out the program without further help.

"In cities of 250,000 inhabitants, gas companies, it seems to me, can well afford to incur a small expense for spreading effective and wholesome propaganda. An allowance of one-half of 1 per cent. of the total operating expenses is but a small layout, in view of the results ultimately achieved. It is certainly money well spent, whether you call it new business propaganda or public good-will maintenance."

OBITUARY.

David Oliver Holbrook, an authority on natural gas problems and head of the Division of Natural Gas in the United States Food Administration, died on Sunday, February 16. He was 47 years old. The funeral was held on February 19 in Pittsburgh, Pa.

Mr. Holbrook was secretary and treasurer of the American Natural Gas Association, president of the Natural Gas Supply Men's Association, and vice-president of the Dayton Pipe Coupling Company.

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NOTE.—The following list includes references to articles published from Sept. 15, 1918 to Jan. 10, 1919.

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